

Near Haystack to Tm

70 Planches

BRITISH ENTOMOLOGY;

BEING

ILLUSTRATIONS AND DESCRIPTIONS

OF

THE GENERA OF INSECTS

FOUND IN

GREAT BRITAIN AND IRELAND:

CONTAINING

COLOURED FIGURES FROM NATURE

OF THE MOST RARE AND BEAUTIFUL SPECIES,

AND IN MANY INSTANCES

OF THE PLANTS UPON WHICH THEY ARE FOUND.

BY JOHN CURTIS, F.L.S.

HONORARY MEMBER OF THE ASHMOLEAN SOCIETY OF OXFORD,
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OF THE ACADEMY OF NATURAL SCIENCES OF PHILADELPHIA, ETC.

VOL. IV.

HYMENOPTERA, PART II.

NEUROPTERA. TRICHOPTERA.

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TO

MONS. P. A. LATREILLE,

*Member of the Institute, of the Legion of Honour, &c. &c. Professor at
the Garden of Plants,*

WHOSE INVALUABLE AND UNRIVALLED WRITINGS
HAVE CONTRIBUTED SO ESSENTIALLY TO THE ADVANCE-
MENT OF SCIENCE,

THE PRESENT VOLUME

IS DEDICATED,

AS A SMALL BUT SINCERE TOKEN
OF THE ESTEEM AND RESPECT OF

THE AUTHOR.

London, Dec. 1, 1830.

TO

WILLIAM SHARP MACLEAY, Esq.

M.A. F.L.S. &c.

TO WHOSE LEARNED AND SCIENTIFIC RESEARCHES

ENTOMOLOGISTS ARE SO GREATLY INDEBTED,

THIS VOLUME

IS INSCRIBED,

AS A TOKEN OF FRIENDSHIP,

AND OF THE ESTEEM OF

THE AUTHOR.

London, Dec. 1, 1831.

SYSTEMATIC INDEX.

ORDER 6. HYMENOPTERA. VOL. IV.

	Plate.
Fam. CHRYSIDIDÆ.	
1 344. <i>Cleptes nitidula</i>	724
2 345. <i>Hedychrum ardens</i>	38
3 346. <i>Chrysis fulgida</i>	8
Fam. FORMICIDÆ.	
4 347. <i>Formica rufa</i>	752
5 348. <i>Myrmecina Latreillii</i>	265
Fam. MUTILLIDÆ.	
6 349. <i>Mutilla ephippium</i>	77
7 350. <i>Methoca ichneumonides</i>	329
Fam. SCOLIIDÆ.	
8 351. <i>Tiphia minuta</i>	664
Fam. SAPYGIDÆ.	
9 352. <i>Sapyga clavicornis</i>	532
Fam. POMPIDIDÆ.	
10 353. <i>Pompilus rufipes</i>	238
1 354. <i>Ceropales variegatus</i>	756
Fam. SPHEGIDÆ.	
12 355. <i>Ammophila campestris</i>	604
Fam. LARRIDÆ.	
13 356. <i>Astata victor</i>	261
14 357. <i>Oxybelus argentatus</i>	480
Fam. CRABRONIDÆ.	
15 358. <i>Trypoxylon clavicorum</i>	652
6 359. <i>Crabro subpunctatus</i>	680
7 360. <i>Rhopalum tibiale</i>	656
8 361. <i>Diodontus gracilis</i>	496
9 362. <i>Pemphredon unicolor</i>	632
10 363. <i>Mellinus sabulosus</i>	580
1 364. <i>Alyson Kennedii</i>	584
2 365. <i>Gorytes bicinctus</i>	524
3 366. <i>Psen equestris</i>	25
Fam. CERCERIDÆ.	
14 367. <i>Cerceris læta</i>	269
5 368. <i>Philanthus androgynus</i>	273
Fam. VESPIDÆ.	
16 369. <i>Odynerus parietinus</i>	137
7 370. <i>Eumenes atricornis</i>	13
8 371. <i>Vespa rufa</i>	760
Fam. ANDRENIDÆ.	
14 372. <i>Hylæus dilatatus</i>	373
10 373. <i>Colletes fodiens</i>	85
1 374. <i>Dasypoda Swammerdamella</i>	367
2 375. <i>Andrena Kirbii</i>	129
3 376. <i>Lasioglossum tricingulum</i>	448
	<i>Halictus</i> ib.
Fam. APIDÆ.	
14 377. <i>Panurgus ursinus</i>	101
5 378. <i>Chelostoma florissomnis</i>	628
6 379. <i>Heriades truncorum</i>	504

	Plate.
380. <i>Anthidium manicatum</i>	61 37
381. <i>Osmia parietina</i>	222 8
382. <i>Megachile Willughbiella</i>	218 9
383. <i>Cochixys vectis</i>	349 46
384. <i>Epeolus variegatus</i>	516 1
385. <i>Nomada Dalii</i>	419 2
386. <i>Melecta punctata</i>	125 3
387. <i>Anthophora Haworthana</i>	357 4
388. <i>Saropoda bimaculata</i>	361 5
389. <i>Psithyrus rupestris</i>	468 6
390. <i>Bombus ericetorum</i>	564 7
391. <i>Apis mellifica</i>	769 8

ORDER 7. NEUROPTERA.

Fam. LIBELLULIDÆ.	
392. <i>Libellula rubicunda</i>	712 49
393. <i>Cordulia Curtisi</i>	616 50
394. <i>Agrion rubellum</i>	732 51
Fam. EPHEMERIDÆ.	
395. <i>Ephemera cognata</i>	708 52
396. <i>Baëtis dispar</i>	484 5
Fam. PANORPIDÆ.	
397. <i>Panorpa germanica</i>	696 53
398. <i>Boreus hyemalis</i>	118 5
Fam. HEMEROBIDÆ.	
399. <i>Chrysopa abbreviata</i>	520 54
400. <i>Hemerobius fimbriatus</i>	202 7
Fam. PSOCIDÆ.	
401. <i>Coniopteryx psociformis</i>	528 58
402. <i>Psocus fenestratus</i>	648 9
Fam. RAPIDIDÆ.	
403. <i>Raphidia ophiopsis</i>	37 60
Fam. PERLIDÆ.	
404. <i>Perla cephalotes</i>	190 61

ORDER 8. TRICHOPTERA.

Fam. PHRYGANIDÆ.	
405. <i>Agrypnia Pagetana</i>	540 62
406. <i>Limnephilus elegans</i>	488 63
407. <i>Phryganea minor</i>	592 64
Fam. HYDROPSYCHIDÆ.	
408. <i>Polycentropus irroratus</i>	544 65
409. <i>Hydropsyche fulvipes</i>	601 6
Fam. LEPTOCERIDÆ.	
410. <i>Leptocerus ochraceus</i>	57 67
411. <i>Molanna angustata</i>	716 68
Fam. PSYCHOMIDÆ.	
412. <i>Chimarra marginata</i>	561 69
Fam. ACENTROPIDÆ.	
413. <i>Acentropus Garnonsii</i>	497 70

ALPHABETICAL INDEX OF HYMENOPTERA, &c. VOL. IV.

	Plate.		Plate.
70 Acentropus Garnonsii	497	Hydropsyche fulvipes	601
51 Agrion rubellum	732	Hylæus dilatatus	373
62 Agrypnia Pagetana	540	Lasioglossum tricingulum	448
21 Alyson Kennedii	584	Leptocerus ochraceus	57
12 Ammophila campestris	604	Libellula rubicunda	712
22 Andrena Kirbii	129	Limnephilus elegans	488
37 Anthidium manicatum	61	Megachile Willughbiella	218
14 Anthophora Haworthana	357	Melecta punctata	125
Apathites rupestris	468	Mellinus sabulosus	580
13 Apis mellifica	769	Methoca ichneumonides	329
15 Astata victor	261	Mimesa, <i>Shuck.</i>	25
53 Baëtis dispar	484	Molanna angustata	716
47 Bombus ericetorum	564	Mutilla ephippium	77
57 Boreus hyemalis	118	Myrmecina Latreillii	265
24 CERCERIS læta	269	Nomada Dalii	419
11 Ceropales variegatus	756	Odynerus parietinus	137
36 Chelostoma florissomnis	628	Osmia parietina	222
64 Chimarra marginata	561	Oxybelus argentatus	480
7 Chrysus fulgida	8	Panorpa germanica	696
51 Chrysopa abbreviata	520	Panurgus ursinus	101
1 Cleptes nitidula	724	Pemphredon unicolor	632
20 Cœlioxys vectis	349	Perla cephalotes	190
30 Colletes fodiens	85	Philanthus androgynus	273
58 Coniopteryx psociformis	528	Phryganea minor	592
5 Cordulia Curtisii	616	Physoscelis, <i>St. Farg.</i>	656
Corynopus, <i>St. Farg.</i>	656	Polycentropus irroratus	544
16 Crabro subpunctatus	680	Pompilus rufipes	238
21 Dasygaster Swammerdamella	367	Psen equestris	25
6 Diodontus gracilis	496	Psithyrus rupestris	468
4 Epeolus variegatus	516	Psocus fenestratus	648
53 Ephemera cognata	708	Raphidia ophiopsis	37
27 Eumenes atricornis	13	Rhopalum tibiale	656
4 Formica rufa	752	Sapyga clavicornis	532
22 Gorytes bicinctus	524	Saropoda himaculata	361
33 Halictus	448	Tiphia minuta	664
3 Hedychrom ardens	38	Trypoxylon clavicernum	652
57 Hemerobius fimbriatus	202	Vespa rufa	760
36 Heriades truncorum	504		

Folio.

Continuation of Errata from Vol. III.

- 381^b last line but one, for *Aira præcox* (Early Hair-grass) read *Carex dioica* mas (Common Separate-headed Carex). I regret that in their journey from Cambridge the labels were displaced, which led to a transposition of the names.
- 389 *Agriotypus armatus*. Mr. Wailes in a letter says, "I took a specimen on the shore of Derwentwater (amongst the small stones so characteristic of lakes amongst the older strata,) in April last. It is a female."
- 395 The characters of ♂ and ♀ added to the figures of the antennæ in the Plate, have been accidentally transposed, and the signs in the description, lines 14 and 17, have been made to correspond, to prevent further mistakes.
- 419^b *Nomada Dalii* was taken at Charmouth, Dorset, May 12, and not in the New Forest.
- 439 line 34, after centre add and produced behind like a scutellum which is sometimes.
- 472^b line 25 for *sublunulate* one read *sublunulate* spot.

VOL. IV.

- 129^b line 4 from the bottom, for *Llandidus* read *Llandidno*.
- 202^b for *Betonica officinalis*, &c. read *Prunella vulgaris* (Self-heal).
ib. last line but 4, for *Dundington* read *Duddington*.
- 357 *Anthophora Haworthana*. Since this species was published I have received a pair from Dr. Howitt, who takes the sexes near Nottingham: the female is so similar to that of *A. retusa*, that the only difference I can discover is in the colour of the spurs to the tibiæ, which are *ferruginous*, and not dusky or black as in *A. retusa*.
- 448 *Lasioglossum tricingulum*. I find that I possess the female of this curious insect.
- 616 line 25, after crossing, add with a tooth at the extremity of the inner margin.
- 632^b last line but one, for *Queckit* read *Quekett*.
- 652 line 32, for *clavigerum* read *clavicernum*.
- 712^b line 41 for *Dorchester* read *Doncaster*.
- 732 *Agrion rubellum* Van. Lin.: the var. figured is *A. aurantiacus* of Mons. de Selys-Longchamps.



Titula vulgaris
= *Pimpla dioica*



Pub. by J. Curtis Jan. 1. 1839

CLEPTES NITIDULA.

ORDER Hymenoptera.

FAM. Chrysididæ. *s. f. (Clypeus geniculate & Trachea long)**Type of the Genus, Spheg semiaurata Linn.*

CLEPTES Lat., Fab., Shuck., Curt.—Ichneumon Rossi.—Spheg Linn.

Antennæ inserted near the margin of the clypeus, approximating, not so long as the thorax, geniculated, velvety, a little attenuated in the male, and 13-jointed, basal joint the longest and stoutest, metallic and hairy, 2nd the shortest, obovate-truncate, 3rd twice as long and linear, the following shorter, oblong, slightly attenuated to the apical joint which is the slenderest and elliptic-conic (1 ♂): shorter, the flagellum curved and attenuated to the base and apex in the female, 2nd joint not very short, 3rd long and narrowed at the base.

Labrum forming a small horny subovate lobe, ciliated with long hairs (2).

Mandibles elongate-subtrigonal, tridentate on the inside towards the apex, pilose externally (3).

Maxillæ terminated by a large ovate ciliated lobe, with a smaller pubescent one on the inside. *Palpi* not very long, pubescent, 5-jointed, 2 basal joints rather short, 3rd longer, very stout, subovate, 4th not so stout, but about as long, 5th the longest, slender and linear (4).

Mentum corset-shaped. *Lip* small, fleshy and concealed. *Palpi* moderate, remote, pilose, triarticulate, 2 basal joints obovate, truncated obliquely, 3rd joint much longer, subfusiform (5).

Head short, transverse, narrowed behind: eyes oval: ocelli 3, forming a triangle on the crown of the head. Thorax obovate with longitudinal sutures, and divided transversely into 4 segments: scutell semi-ovate: metathorax subquadrate, the angles acuminate. Abdomen ovate, depressed, not concave beneath, 5-jointed in the males, 4-jointed in the females: oviduct exerted, telescopic, as long as the body (7 ♀), with an aculeus at the apex (a) and a lanceolate valve beneath (v). Wings superior with a small sublanceolate costal cell and 2 discoidal cells, the external longitudinal nervures reaching the margin: inferior wings with very faint nervures. Legs moderate: thighs short, incrassated towards the base: tibiæ clavate, spurred at the apex: tarsi simple, 5-jointed, basal joint long, 4th small: claws and pulvilli distinct (8 †).

NITIDULA Fab.—Curt. Guide, Gen. 656. 2.

FROM the numerous illustrations we have given of the Cynipidæ of Latreille, it will be remembered that they either have no labrum, or it is so minute that it has not been discovered, except in *Perilampus* and *Smiera*: the small labrum of *Cleptes* forms a beautiful transition from the above family to the Chrysidæ through *Hedychrum*; and I have lately received a most remarkable metallic Bee from America, I believe from Columbia, which will prove, I expect, that there exists a strong affinity between the Andrenidæ and Chrysidæ. Latreille considered that *Cleptes* was allied to *Bethylus* (Pl. 720),

16. 7805 h. parvulus de *Perilampus* robustus.

but I must confess I cannot see any analogy, and with *Tiphia* (Pl. 664) it has no relationship.

The *Cleptes* are parasitic upon other Hymenoptera, and St. Fargeau seems to think that *C. semiaurata* is the parasite of a *Tenthredo*.

It is very remarkable that there does not appear to be any very marked character to distinguish the males of the two species, although the females are so very dissimilar: the greatest difference seems to me to be in the colour of the 3d segment of the abdomen, which has much more of the ochre colour in *C. semiaurata* than in *C. nitidula*, and the tibiæ I believe are generally more ochreous.

1. *semiaurata* Linn. Panz. 51. 2. ♂.—*splendens* Fab. ♂.—*auratus* Panz. 52. 1. ♀.

Male bright metallic green, slightly villose: antennæ black, basal joint green: head and thorax coarsely punctured, faintest on the disc of the latter: metathorax rugose: abdomen shining deep ochre, the extremity of the 3d segment black, forming a point in the middle: the following bright blue: wings slightly fuscous, the stigma and nervures brown: legs fulvous, coxæ and thighs green, tarsi fuscous.

Female bright cupreous, 5 basal joints of antennæ ochreous, the remainder black: abdomen as in the male: wings fuscous, with the base and an irregular long spot beyond the disc transparent: legs entirely fulvous.

Rather larger than the following: it lives in sandy places, and is not uncommon in the vicinity of London in June; Mr. Paget takes it at Yarmouth; I used to find the females in gooseberry bushes in a garden, and they have been detected on the horse-bean in a field near Coventry.

2. *nitidula* Fab.—Curt. Brit. Ent. pl. 724 ♀.—Panz. 106. 11.

Male bright metallic green, inclining more or less to blue or purple: antennæ black, basal joint green, head and thorax not thickly punctured; metathorax deeply and closely punctured: abdomen shining deep ochreous, the 3d segment, excepting the base and the following, bright blue, green, or purple, the apex punctured, wings slightly fuscous with a cloud on the disc, the nervures and stigma piceous: legs bright green: tibiæ ochreous, the four posterior often piceous, excepting the tips: tarsi fuscous.

Female. Head and thorax cupreous: prothorax ferruginous-ochre, metathorax bright green: antennæ black, 2d and 3d joints ochreous: abdomen as in the male: wings with a slight cloud at the stigma: legs ochreous, hinder thighs and coxæ piceous, tarsi fuscous at the apex.

Taken by Mr. Paget on the sand hills near Yarmouth in June: Mr. Rudd finds it plentiful in Yorkshire, and it occurs also in the New Forest.

Trinia glaberrima (*Pimpinella dioica*), Dwarf Burnet Saxifrage, from St. Vincent's Rocks, was communicated by G. H. K. Thwaites, Esq.



Chrysomelidae, Lamiaceae, No. 1, 1924

HEDYCHRUM ARDENS.

ORDER Hymenoptera. FAM. Chrysididæ *Lat., Leach.*

Type of the Genus C. violaceum Rossi.

HEDYCHRUM *Lat., Leach.* Chrysis *Linn., Fab., Jurine.*

Antennæ inserted close to the margin of the clypeus, geniculated, fusiform, 13-jointed; first joint the longest. (1.)

Labrum very minute, long, attenuated, ciliated. (2.)

Mandibles hairy, externally arcuated, with 3 sharp teeth towards the apex. (3.)

Maxillæ horny at the base, membranaceous towards the apex, ovate, entire, ciliated: *Palpi* 5-jointed, longer than the maxillæ, third joint rather thicker, fourth and fifth rather longer than the others. (4.)

Mentum long, dilated anteriorly: *Palpi* short, 3-jointed: *Lip* with the margins conniving externally. (5.)

Clypeus with a deep impression between the eyes, receiving the first joint of the antennæ. Thorax semi-cylindric, angular, divided by 3 transverse sutures. Metathorax not elongated into a scutellum. Body contractile into a ball. Abdomen attached only by a portion of its transverse diameter, semicircular, with the extremity rounded, convex above, concave beneath, composed of three joints, the second very large. Tarsi 5-jointed. (8.) Superior wings with the marginal cell scarcely complete at the apex; discoidal cells very obscure. Inferior wings without distinct nerves.

ARDENS *Lat.* Coq. *Illus. Icon. Ins. dec. 2. p. 59. t. 14. f. 7.*

Shining, pubescent. Head and thorax deeply, abdomen minutely punctured. Green, centre of head, thorax and abdomen, crimson reflecting purple and gold. Posterior angles of thorax blue. Under side of abdomen black, sometimes aureous towards the base. Wings fuscous, with alternate bands of green and gold at the posterior margin. Antennæ black, green at the base. Legs green. Tarsi rufous.

In the Cabinets of the British Museum and the Author.

IN a former number (folio 8.) was given the Genus *Chrysis*; and another group of the same family, separated by Latreille, is the subject of the present paper. Although the *Hedychri* may equal the *Chrysidæ* in splendour, their form is by no means so elegant; the obtuseness and breadth of the abdomen di-

1) Head & thorax in 785, 5 up - (dorsal & dorsal in coll.)

stinguishing them at first sight; and upon further comparison, the absence of the transverse line of impressed dots upon the last joint of the abdomen, as well as the great difference in the mandibles, independently of the variation in the wings, excite our astonishment that Jurine should have rejected a Genus so natural and well established.

Dr. Leach has divided this Genus into those with the apex of the abdomen entire, 1. *H. punctatum* Leach?; 2. *lucidulum* Geoff.; 3. *ardens* Lat. The others notched at the apex, 4. *regium* Geoff.; 5. *violaceum* Rossi. There are also in the Museum cabinet a species called *cæruleum* and another unnamed. Our insect, which was taken several years back in Norfolk, agrees tolerably well with Latreille's description, and perfectly with the British specimens in the Museum, but not very well with the rude and careless figure in Coquebert. Some specimens are twice the size indicated in the plate by the crossed lines.

The habits of this Genus are somewhat dissimilar to those of the *Chrysidæ*, being generally found in the sunshine upon the leaves of brambles and other bushes, from which they fall upon being approached, rolling themselves up into a ball.

The plant figured is *Antirrhinum Cymbalaria* (Ivy-leaved Snapdragon).



Stachys germanica L. 1824

CHRYSIDIS FULGIDA.

ORDER Hymenoptera. FAM. Chrysididæ.

Type of the Genus, Chrysis ignita Linn.

CHRYSIDIS Linn., Fab., Lat., Panz., Jur., Curt., &c.—Vespa Geoff.

Antennæ inserted close to the base of the clypeus, subfusiform, geniculated, 13-jointed, basal joint long, robust and slightly hairy, the remainder velvety, 2nd small, 3rd longer than the following, the remainder decreasing in length to the apex, the terminal one being very small, compressed and subovate (1).

Labrum transverse, somewhat oval, ciliated with long hairs (2).

Mandibles elongate-trigonal, slightly hairy externally, bent and acute at the apex, with 1 or 2 notches on the inside (3).

Maxillæ furnished with a narrow internal lobe, the external one large, suborbicular and pilose, the internal portion thickened and forming a slight projecting point on the margin. *Palpi* rather long pilose and 5-jointed, basal joint a little shorter than the 2nd and 3rd, the latter being dilated, 4th and 5th joints long, the former clavate, the latter nearly linear (4).

Mentum oblong, the sides concave (5 a). *Palpi* pilose and formed of 3 short equal joints, the 1st and 2nd subobovate, 3rd scarcely so stout and oval (b). *Labium* subtrigonal, the sides recurved (c).

Male smaller than the female. Head transverse: face concave. Eyes ovate. Ocelli 3 in triangle. Thorax oblong, collar large, postscutellum broad and short, the sides acuminate. Body contractile into a ball. Abdomen attached by an exceedingly short petiole elongate-ovate, semicylindric, being convex above and flat or concave beneath, composed of 3 segments, the 2nd very large, the last with a deep transverse suture bearing a row of strong punctures, the margin generally dentated. Ovipositor long, composed of several coriaceous tubes, terminated by 2 strong pilose cylindric appendages with an aculeus between them. Superior wings with one large perfect marginal cell, submarginal cells imperfect, two discoidal cells, the superior one large with a short branch next the limb; inferior wings with the nervures very obscure. Legs; posterior the longest. Thighs short. Tibiæ short and spurred, anterior with a long dilated spine at the apex. Tarsi 5-jointed, basal joint the longest, emarginate on the inside at the base, in the anterior pair. Claws and Pulvilli distinct (8).

FULGIDA Linn. Faun. Suec. p. 415. n. 1669.—Curtis's Guide, Gen. 659. 11.

In the Cabinets of the British Museum, Mr. Dale, &c.

NOTHING can exceed the splendour and brilliancy of the Chrysididæ, which have been compared by Latreille to precious stones, and very aptly called by Jurine the Humming-birds of entomologists. It must be confessed that Nature has been lavish in adorn-

1. Chrysis fulgida (Linn.) *2. Chrysis ignita (Linn.)* *3. Chrysis ruficornis (Linn.)* *4. Chrysis ruficornis (Linn.)* *5. Chrysis ruficornis (Linn.)* *6. Chrysis ruficornis (Linn.)* *7. Chrysis ruficornis (Linn.)* *8. Chrysis ruficornis (Linn.)* *9. Chrysis ruficornis (Linn.)* *10. Chrysis ruficornis (Linn.)*

ing them with such beautiful and effulgent colours, that our astonishment and admiration are equally awakened on contemplating them. Latreille supposes this splendour may dazzle their enemies and so facilitate their escape; and this superb armour with which they are covered, surpassing any that we have ever read of even in romance, appears to be impenetrable and quite equal to resist on every side the weapons of an assailant,—nevertheless they seem to be timid; for on touching them they roll themselves up into a ball, conscious, apparently, that their armour is their best defence. They seem to be supplied with this coat of mail to make amends for their weak sting, which being placed at the extremity of a long telescopic-formed oviduct is only able to pierce soft bodies; this flexible tube they can extend to a very great length: I have seen it reach the base of the anterior wings.

Latreille has very judiciously divided the Chrysididæ into seven genera, five of which are British; but Jurine having founded his groups upon the form of the cells of the wings, has not adopted them.

Our species of Chrysis may be thus divided.

* Apex of abdomen producing 4 spines.

6. 789 316
+ 8 8 12 12 12
1. *C. ignita* Linn. Faun. Suec. 414. 1665.—Don. Brit. Ins. v.1. pl. 7.—Panz. 5. 22.
Length from 2 to 7 lines. Yellow or blue green, shining, clothed with soft upright gray hairs, thickly and coarsely punctured: antennæ velvety black, excepting the 2 basal joints which are green: head more or less purple or blue on the crown, collar with a spot in the centre and an elongated mark on each side, of the same colour: thorax variegated with purple also: abdomen effulgent, golden crimson, sometimes green on the sides and violaceous on the back, down the two first joints of which there is an elevated line; the punctation is generally very coarse at the base, fine on the sides and sometimes very minute, thick or vanishing towards the apex which is crenated, forming 4 teeth, much more acute in the males than females; nearly at the base of them is a semicircular row of from 14 to 18 deep punctures: wings stained brown, nervures piceous: legs green: tarsi velvety black: ovipositor frequently exerted, brownish ochre, the terminal plate of the abdomen beneath generally black.

This is one of the most variable insects in size, colour, and sculpture, and I have little doubt but a considerable number of the following species are nothing more than extreme varieties.

The head and thorax are bright green of various hues, variegated with deep blue or purple, sometimes entirely of a fine chalybeous colour; the body resembles the brightest gold, reflecting most lovely tints of crimson or violet, sometimes eneous or cupreous, and more or less encircled with a beautiful yellow green; the ridge on the back of the body sometimes extends nearly to the apex, the punctures are in some thick and coarse, in others innumerable and minute, and again almost vanishing: the teeth at the apex are also much less developed in some than in others.

This insect is distributed over the whole country, and is seen

when the sun shines running over the sides of walls, posts, and sandy banks, from May to the middle of August.

2. *C. affinis* Leach.—Sam.—Curtis's Guide.

About the size of *C. ignita*, and probably only a variety; the fore and hind part of the head, 3 spots on the collar, the mesothorax and scutellum are blue; back of the abdomen purplish; the apex with the teeth very short.

3. *C. nitens* Ste.—Curtis's Guide.

4. *C. micans* Ste.—Curtis's Guide.

5. *C. fulminans* Ste.—Curtis's Guide.

6. *C. confinis* Ste.—Curtis's Guide.

These are probably merely varieties of *C. ignita*, as well as the three next.

7. *C. effulgens* Leach.—Harris's Exposition, pl. 19. f. 2.?

Very similar to *C. ignita*. Mr. Dale has taken it in June and July at Glanville's Wootton, Dorset.

8. *C. pulchra* Ste.—Curtis's Guide.

Taken by Mr. Dale at Dawlish, Devon, May 22nd.

9. *C. ephippium* Ste.—Curtis's Guide.

Length 4 lines. Duller than *C. ignita*, thickly punctured and clothed with soft upright gray pubescence; bright green: antennæ velvety black, 2 basal joints green, crown of the head, a central and 2 lateral spots on the collar, the whole of the mesothorax and centre of the scutellum dark blue-purple: abdomen with the sides slightly coarctate, with a ridge down the back, rather dull golden crimson, the back somewhat blue, the row of punctures sometimes irregularly united, teeth rather acute; beneath green to the apex variegated with gold: wings slightly stained with brown, the nervures piceous: tarsi velvety black.

I do not think this is a good species, and it may be the other sex of the variety named *C. affinis*. Taken by Mr. Dale in June at Puddle Town and Glanville's Wootton; near Cambridge; at Amesble, and in the Isle of Bute.

10. *C. aurulenta* Ste.—Curtis's Guide.

Length $3\frac{1}{2}$ lines. Thickly and rather coarsely punctured, clothed with soft long gray pubescence, especially the head; bright shining green, crown of the head and the whole of the mesothorax deep purple: abdomen with an elevated line down the back, golden reflecting crimson, 12 or 14 punctures surrounding the apex, the central teeth somewhat approximating: wings scarcely tinted, nervures piceous: antennæ and tarsi, excepting the two basal joints of the former, velvety black, underside bright green to the apex.

This insect I have taken near London.

11. *C. fulgida* Linn. F. S. 415. 1669.—Curt. Brit. Ent. pl. 8.—Panz. 79. 15.

Shining, deeply and thickly punctured, pubescent; bright green, variegated with purple and green: abdomen with an elevated line down the back, the 2nd and 3rd joints only aureous, reflecting bright crimson on the back, greenish on the sides, apex surrounded by about 16 punctures, and furnished with 4 rather acute teeth, beneath green and black: tarsi and antennæ, excepting the 2 basal joints of the latter, black: wings stained brown, nervures piceous.

The beautiful female represented in the plate was taken with other specimens in June at Birch Wood, in Kent, by Mr. Standish; it has also been found on gravelly banks in July at Bexley, in the same county, by Mr. Samouelle; it has likewise occurred in Epping Forest; Coombe Wood; Teignmouth, Devon; and Mr. F. Walker has met with it at Southgate.

12. *C. Stoudera* Jur. pl. 12. f. 42.—Panz. 107. 12.

Length $3\frac{1}{2}$ lines. Slightly shining, pubescent, thickly and strongly punctured, deep blue-purple, 2nd and 3rd joints of abdomen gold reflecting crimson and green, the former with a large orbicular-quadrangle purple spot, extending from the base beyond the middle; about 18 punctures surrounding the apex, which has 4 strong teeth: antennæ and tarsi black, excepting the two basal joints of the former: wings slightly stained brown, nervures piceous.

Rare: June, sandy banks near London.

13. *C. bidentata* Linn.—Don. 1. 19.—Panz. 77. 15.—*dimidiata* Fab.

Length nearly 4 lines. Thickly and strongly punctured, pubescent, shining: collar, metathorax and scutellum golden-crimson: abdomen with an elevated line down the back, the principal part of the posterior portion of the basal, and the whole of the 2nd articulation above, of the same colour, apex with a curved line of strong punctures, the apex emarginate, forming 4 obscure teeth: antennæ and tarsi black, except in the 2 basal joints of the former.

June, July, and August, at Cambridge; Bedford; Dover; Bideford, Devon; and Isle of Portland, J. C. Dale, Esq. I once saw it in some abundance going out and into the burrows of an *Odynerus* (pl. 137.), on a sunny bank in Darent Wood, probably in order to deposit its eggs in those of the *Odynerus*.

15. *C. inermis* Ste.—Curtis's Guide.

Whether this be a variety of the foregoing species I am unable to ascertain.

16. *C. succincta* Linn. Syst. Nat. v. 1. pars 2. p. 947. n. 3.—Panz. 77. 16.

Length 3 lines. Strongly and thickly punctured, pubescent, bright green, shining: crown of the head purple: collar variegated with purple: mesothorax golden-green and red: abdomen golden-green, the back crimson, apex triemarginate, forming 4 small teeth: wings slightly stained brown, nervures piceous: antennæ and tarsi velvety black, the former with the 3 basal joints green; a curved line of strong punctures round the apex.

This rare and beautiful species has been taken by Mr. Dale in gravel-pits at West Hurne, Hants, 12th of July 1823; and I think I have seen it on a sandy bank in August at Ramsdown, near Heron Court, the property of the Earl of Malmesbury. The specimen in my possession was communicated to me by Captain Blomer, who took it at Bigbury Bay, Devon, 8th of September 1823. It has also been observed near Bristol by Mr. Millard.

** Apex of abdomen tridentate.

17. *C. cyanea* Linn. F. S. 414. 1667.—Don. 7. 235.—Panz. 51. 10.

Length $2\frac{1}{2}$ to $3\frac{1}{2}$ lines. Thickly but not deeply punctured, pubescent,

7th July 1823
at Bexley
4
found in the same place as the female of the preceding species, at Bexley, near the river, on a sandy bank, on the 7th of July 1823, by Mr. Samouelle.

glossy, greenish blue, crown of the head purple : thorax variegated with the same, 1st and 2nd joints of abdomen black or blue purple above, apex with a curved line of strong punctures, biemarginate, forming 3 scarcely visible teeth : wings nearly transparent, nervures piceous : antennæ and tarsi black, basal joint of former green.

From beginning of June to August, near London ; in Norfolk ; Kimpton near Andover ; New Forest, and Glanville's Wootton. I find this species on old posts and dead trees : and Donovan says it is common on fruit-trees.

*** Apex of abdomen rounded, without teeth.

18. *C. rufa* Panz. 79. 16.—*Curt. Guide*.

Length $3\frac{1}{2}$ lines. Rather robust, dull, exceedingly thickly punctured, pubescent : head and thorax coarsely punctured, green, crown of the head and mesothorax dark blue or purple : abdomen so thickly and minutely punctured as to appear like frosted gold reflecting crimson, apex with a semicircular line of punctures : wings stained brown, except at the apex, nervures piceous : antennæ and tarsi velvety black, the former with the 2 basal joints green.

End of June, sandy banks and chalk-pits, Darent and Dover, Kent ; beginning of June on posts, &c., Chesterton near Cambridge, and Isle of Portland ; also to the end of July, Parley Heath. J. C. Dale, Esq.

19. *C. austriaca* Fab. Piez. 173. 15.—*radians* Harr. *Expos. tab. 19. f. 3*.

Length $4\frac{1}{2}$ lines. Thickly and coarsely punctured, shining, clothed with fuscous pubescence : head and thorax green, variegated with blue : abdomen golden, reflecting crimson, nearly truncated at the apex, with a row of small punctures : wings tinged brown, nervures piceous : antennæ and tarsi velvety black, 3 basal joints of the former green.

It is remarkable that Fabricius in his essential character, says, "the anus is quadridentate ;" and in his specific description, which immediately follows, he says "that the anus is unarmed."

From June 7th to July 24th, Bottisham, Cambridgeshire ; Glanville's Wootton and Beaminster, Dorset. J. C. Dale, Esq.

20. *C. cærulipes* Fab. *Syst. Piez.* 173. 13.—*Panz.* 107. 11.—*cærulescens* Fab. *Ent. Syst.*—*Coq. tab. 14. f. 5*.—*Leachii* Ste.

Length $4\frac{1}{2}$ lines. Deeply punctured, crimson : metathorax, breast and legs blue ; antennæ black : superior wings stained yellowish brown.

parvula d'Oon, *C. aurantiorum*, *C. aurantiorum*, *C. bicolor*, &c.

A single specimen of this fine species is contained in the cabinets of the British Museum. I believe it was presented by Dr. Leach.

21. *C. variegata* Curtis.

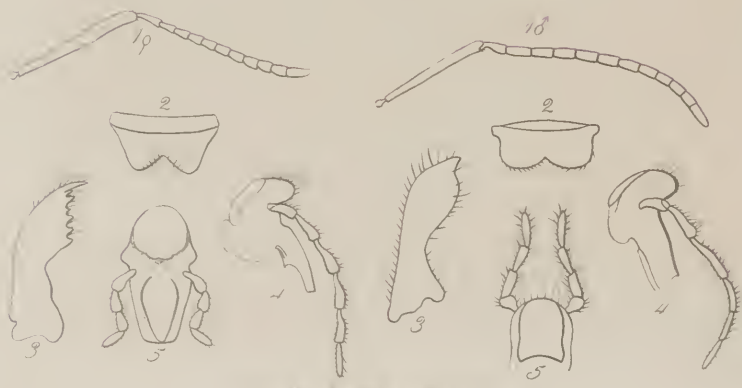
About 2 lines long : slender, smooth, shining, yellowish green. Head dark green : antennæ black ; collar and thorax banded with golden red ; abdomen with the basal joint golden, red across the middle ; 2nd and 3rd joints entirely of that colour : wings slightly fuscous : legs green and black.

This little species reminds us at first sight of *C. succincta*, but it has the apex of the abdomen entire, which is the reason I have not adopted the name *nitidula*, under which it stands with a ? in the

British Museum ; as Fabricius states that the apex of his insect is quadridentate.

It was taken at Exeter, probably by Dr. Leach.

The Plant represented is *Thlaspi* (*Capsella Dec.*) *Bursa Pastoris* (Shepherd's Purse).



- FORMICA RUFA.

The red, hill, or horse Ant, or Pismire.

ORDER Hymenoptera.

FAM. Formicidæ.

Type of the Genus, Formica rufa Linn.

FORMICA Linn., &c.

Antennæ longer than the thorax in the male (1 ♂)*, filiform, slender, geniculated, 13-jointed, basal joint very long, 2nd slender at the base, nearly as long as the following, which slightly decrease in length, apical joint as long as the 3rd; the tip attenuated: rather shorter in the female, slightly clavate, 12-jointed: scarcely so long as the thorax in the neuter (1 ♀), 12-jointed, 2nd joint longer than the 3rd; the following obovate-truncate, increasing in diameter, but decreasing in length, the apical joint as long as the 2nd, elongate-ovate.

Labrum transverse, ciliated, notched and broad in front in the male (2), attenuated, with a large triangular notch in the neuter (2).

Mandibles rather small in the male and gaping (3), hairy, constricted below the middle, dilated above, with a trigonate apex; forming a beak in the neuter, truncated obliquely and serrated, the apex elongated (3).

Maxillæ short, the apex rounded, slightly hairy. *Palpi* 6-jointed, hairy, 3 basal joints the stoutest in the male, 1st the shortest, 2nd longer clavate, 3rd the longest, remainder slender, nearly as long as the 2nd (4): stouter in the neuter, the joints nearly of equal length, apical joint slender (4).

Mentum short: *Lip* concealed in the male, large and fleshy in the neuter. *Palpi* inserted on each side, hairy and 4-jointed, basal joint pyriform, 2nd and 3rd oblong or obovate, 4th a little the longest in the male, the apex ovate-conic (5).

Trophi of the female similar to those of the neuter. Head rather small in the male, ovate-trigonate: ocelli 3 in triangle on the crown: eyes moderate, lateral. Head more quadrate-ovate in the female and neuter: ocelli minute: eyes small. Thorax ovate in the male and female; narrow, elongated and constricted in the middle in the neuter: petiole short, producing a thick vertical scale. Abdomen elongate-ovate in the male, large and globose-ovate in the female and neuter: sexual organs large and exposed in the male: sting not punctorius. Wings ample, superior with 1 marginal, 2 submarginal and a discoidal cell or areolet: neuter apterous. Legs moderate and slender: thighs simple: tibiæ with one slender acute spine at the apex of each, dilated in the anterior: tarsi 5-jointed, basal joint long, curved at the base in the anterior, 4th small, subcordate: claws strong: pulvilli distinct.

F. RUFA Linn.—Curt. Guide. Gen., 661. 3.

Male piceous-black: scale rather large, thick and orbicular, the apex slightly concave: legs and apex of abdomen bright-ochreous: coxæ, base

* The 5 figures on the right of the plate are dissections of the male, those on the left of the neuter; the coloured figures represent the male, female and neuter.

1/2 de June 6. 1863 58 and on these are down the details of the same.

of thighs, and tips of tarsi, pale piceous : wings with a slight yellowish-brown tinge, nervures and stigma darker.

Female ferruginous, top of head and disc of thorax and scutellum subpiceous, hinder part of thorax flat and oblique ; scale somewhat obtrigonal, with the angles rounded : abdomen very glossy, bright pitchy-æneous, margin of the base and bands beneath ferruginous : wings ochreous-brown, lighter towards the tips.

Neuter dull pitchy : head thorax and scale ferruginous : crown channeled, the whole dull pitchy, clypeus and sides bright ferruginous, a purplish brown spot on the disc of the thorax, and a smaller one on the scutellum : base of abdomen sometimes ochreous : legs often inclining to castaneous, trochanters ferruginous.

The history of the industrious and provident ant has been familiar to every one from the earliest ages, and the more recent researches of Huber on this subject are highly interesting. I am sorry that a summary of their œconomy is the utmost that my space will afford, but the amusing account given by Kirby and Spence will supply the deficiency.

Each species of ant comprises three different sorts, namely, the males, females, and neuters : there are sometimes two varieties of these last, varying in size : they form nests in the earth or under stones, and their sagacity, their unceasing industry, their perseverance in overcoming difficulties, and the care they evince for their progeny, are wonderful, and well deserving the attention of man.

The female ant lays from 4000 to 5000 eggs ; those of the neuters are the smallest ; they produce maggots that live a twelvemonth or upwards ; these become pupæ, in which state the males and neuters remain 4 and the females 6 weeks ; they are inclosed in oval whitish cocoons, which are erroneously called ants' eggs, and it is these we see them carrying off to a place of security when they are disturbed ; the ants also bring them to the surface for warmth, or heap them up in the nests. The males and females are generally few in number compared to the workers, yet they are occasionally found in myriads ; the latter are often deprived of their wings, being pulled off either by themselves or by the neuters, in order that they may not depart from the nest, and they then work like neuters. Gould says this does not happen till they become mothers. Ants are chiefly nourished by the saccharine fluid from Aphides (pl. 576 and 577), and they remain in their nests through the winter in a torpid state. The males and females swarm from Midsummer to Michaelmas, and the neuters bite with their serrated jaws, but none of the British species sting. Of these, eleven have been recorded in the Guide, but I have only seen indigenous examples of 5 of them. The species figured forms a large nest of straws, sticks, leaves, and other convenient materials : they are very partial to oak-woods and fir-groves, the leaves of the coniferæ supplying them with admirable and very portable building materials : they seem to be at work day and night from March to the end of October : the males and females are commonly found in June and July.



MYRMECINA LATREILLII.

ORDER Hymenoptera. FAM. Formicidæ *Leach*. Formicariæ
Lat.

Type of the Genus Myrmecina Latreillii Nob.

MYRMECINA Nobis.

Antennæ inserted in the middle of the face, remote, longer than the head and thorax, geniculated, hairy; 13-jointed, basal joint short, but twice as long as the 2nd, which is subglobose, the 3rd and following oblong, those beyond the 5th being rather obovate-truncate, terminal joint the longest, elongate-conic (1). *Labrum* large and exserted, coriaceous, dilated at the base, each side producing a small lobe beneath; anterior margin rounded and notched, with a few bristles and ciliated (2).

Mandibles none, at least in the male.

Maxillæ large and dilated, terminated by a broad membranous and ciliated lobe, meeting behind the mentum when at rest.

Palpi rather long and slender, 4-jointed, basal joint the smallest, 2nd and 3rd of nearly equal length, 4th long subfusiform (4).

Mentum subovate, truncated at the base, with an arched suture towards the top. *Lip* none? *Palpi* rather long and slender, triarticulate, 1st and 2nd joints nearly of equal length, the 3rd longer and subfusiform (5).

Head subglobose. Eyes globose. Ocelli very prominent, forming a large triangle. Thorax ovate. Metathorax bidentate. Peduncle biarticulate, 2nd joint the largest and globose. Abdomen ovate-conic, 5-jointed, basal joint covering the greater portion of the body. Wings with a trigonate stigma, the marginal cell pedicled at the apex; one discoidal cell, and the apical nervures obscure. Legs rather long. Thighs long, slender, dilated in the middle. Tibiæ short, anterior producing a pectinated spine. Tarsi 5-jointed, basal joint as long as the tibia, the remainder oblong. Claws small, Pulvilli distinct (8, a fore leg).

Obs. All the figures and descriptions were taken from a male.

LATREILLII Nobis.

Smooth, shining, piceous black; sparingly clothed with hairs. Eyes black. Head and thorax with a few punctures. Antennæ and legs ferruginous, thighs and tibiæ piceous in the middle. Wings very iridescent, yellowish fuscous, stigma and nervures brown.

In the Author's Cabinet.

1/ default (c. 5045). Mid sous le microscope, le piceux, dans les nervures.

THE only specimens I have ever seen of this little insect were all males, which I swept off rushes the middle of August and beginning of September, at the back of the Isle of Wight, where they were flying about; and having been unsuccessful in searching for the females and neuters, I am induced to publish the materials I possess, hoping that it may lead to the discovery of the sexes.

Myrmecina is nearly related to Myrmica, of which genus I would willingly have made it a division; but the short basal joint of the antennæ, the different nervation of the wings, and above all, the absence of the mandibles, rendered this desirable object impracticable. The labrum also is remarkable for having the basal angles thickened and produced; and these I am almost disposed to think are modifications of mandibles.

This nondescript insect I have the pleasure of dedicating to my esteemed friend Mons. Latreille, whose investigation of the family to which it belongs, as well as his numerous valuable works on Entomology, have contributed so effectively to the philosophical advancement of Science.

The beautiful plant represented is *Lathyrus sylvestris* (Wild Lathyrus), it grows luxuriantly on the sloping cliff between Bonchurch and Luccomb Chine, and spontaneously ornaments the elegant grounds of James Vine, Esq. at Puckaster Cove in the Isle of Wight.



Ichneumonidae. Genus. Lucid. 1830.

MUTILLA EPHIPIUM.

ORDER Hymenoptera. . FAM. Mutilladæ Lat., Leach.

Type of the Genus Mutilla Europæa Linn.

MUTILLA Linn., Fab., Lat., Leach, &c.

Antennæ distant, somewhat fusiform, much longer than the head, 13-jointed in the males, 12-jointed in the females, 1st joint long, hairy, incurved, not receiving the 2nd, which is small, cup-shaped, the 3rd obconic, 4th and following nearly of equal length (fig. 1). *Labrum* nearly concealed by the clypeus, transverse, coriaceous, ciliated, and producing a few long bristles near its base (2). *Mandibles* exerted, long, narrowed near the base, tridentate (3). *Maxillæ* long; terminal lobe minute, rounded, ciliated, membranaceous: *Palpi* very long, hairy, 6-jointed, 1st joint bent, 2nd dilated, remainder somewhat long, the last slender cylindric (4). *Mentum* corneous, trigonate elongated (5 a): *Palpi* as long as the mentum, to the anterior angles of which they are attached, pubescent, 4-jointed, 1st joint bent, clavate, 2nd and 3rd compressed, the latter somewhat rhomboidal, 4th long slender cylindric (b): Lip coriaceous, very short, hollow, completely concealed behind the mentum.

Clypeus produced, emarginate. Head globose. Ocelli 3 in the males alone. Thorax of the male very convex with a transverse suture and scutellum; of the female cubical without transverse sutures and scutellum. Abdomen attached by a short peduncle, ovate, 2nd segment large, somewhat campanulate. Wings of males pubescent, stigmata celluliform, marginal cell remote from the apex, submarginal cells 3. Females apterous; armed with a sting. Anterior legs short, with a long, compressed, membranaceous spine at the apex of the tibiæ, the 4 posterior tibiæ spurred (8 a fore leg).

EPHIPIUM Fab. Ent. Syst. v. 2. p. 370. n. 18. mas.—rufipes. Fab. Ent. Syst. 2. 372. 26. fem.

Male black, shining, pilose with long whitish hairs. Head somewhat minutely punctured. Thorax and scutellum brick-colour, anterior margin black extending in the centre as far as the suture, strongly punctured; metathorax very coarsely punctured. Abdomen strongly punctured. Wings stained yellowish fuscous with alternate fascia of red and green next the posterior margin.—*Female* black glossy. Head thickly punctured. Neck, thorax, peduncle and basal joint of abdomen brick-colour, thorax coarsely punctured. Abdomen minutely punctured, rufous at the apex and the margins of the segments, which appear silvery from the denseness of the hair, as well as a spot on the 2nd segment. Antennæ and legs rufous, the former fuscous towards the apex.

In the Author's Cabinet.

Mutilla ephippium O. 825, 15 cy.

ALTHOUGH the *Mutilladæ* bear considerable resemblance to the *Formicadæ* their economy is totally different, the latter living in societies exhibiting males, females, and neuters, which last only are apterous; the former being solitary, having no neuters, the males only being furnished with wings. It is unnecessary to go any further into the differences of the two families. The female *Mutillæ* want the little eyes upon the crown of the head, as well as the wings with which the males are furnished; and the eyes and thorax are very differently formed. Jurine has justly observed "What is the object of Nature in establishing such disparities, and where is the utility of it? These are problems that we cannot resolve, because of our ignorance of the history of these insects, but which well deserve the attention of naturalists." It is well known that they inhabit sandy districts, and it is probable the females form their nests and deposit their eggs in such situations, which employment would render wings and ocelli of little use; whereas the males, which may be less numerous than the other sex, are supplied with wings to enable them to go in search of the females, as is frequently the case amongst the Lepidoptera and other orders.

We are able to record at present only three species of this beautiful genus as inhabitants of Britain: 1. *M. Europæa* Linn.; 2. *calva* Fab.; 3. *Ephippium* Fab. The first is common in sandy lanes and foot-paths in June,—it is figured in Donovan's *Brit. Ins.* v. 6. p. 212.; the second, (in the cabinet of Mr. Stephens,) is figured in Coquebert's *Icon. Ins.* tab. 16. f. 10. Latreille and many other entomologists have long suspected *M. Ephippium* and *M. rufipes* to be the sexes of the same species, since we only know the males of the one, and the females of the other: as such I have ventured to give them, having found both insects in this country,—the female in a gravel-pit, and the male flying over a sunny bank near Shooter's-hill, Kent, the 15th June 1822.

Bryum subulatum (Awl-shaped Screw-moss) is figured in the plate.



METHOCA ICHNEUMONIDES.

Sphegides mutillorum
ORDER Hymenoptera. FAM. Mutillidæ Lat., Leach.

Type of the Genus, *Methoca ichneumonides* Lat.

METHOCA Lat., Lea., Curt.—*Mutilla* Jur.

Antennæ inserted at the base of the clypeus, longer than the head, curved, nearly filiform, pubescent, 12-jointed, basal joint short and very robust, 2nd the shortest, remainder oblong, slightly decreasing in length to the last, which is elongate-ovate (1).

Labrum inserted under the clypeus, transverse oval, ciliated and producing a few long bristles (2).

Mandibles long, slender, slightly curved, bidentate at the apex, clothed with many long bristles (3).

Maxillæ small, terminated by a minute semilunular ciliated lobe.

Palpi long, pilose, 6-jointed, basal joint rather the shortest, 4th the longest, 2nd and 3rd a little stouter than the others (4).

Mentum convex oblong, rounded before. *Lip* none, or very minute. *Palpi* rather long and pilose, inserted on each side the mentum close to the fore-part, 4-jointed, 1st joint slender at the base, terminal one a little the longest (5).

Head large subglobose. Eyes lateral oval. Ocelli 3 in triangle on the crown. Trunk nodose, formed of 3 segments, the 1st or prothorax obovate, the 2nd or mesothorax smaller and oblong bearing an ovate scutellum, the 3rd or metathorax ovate, not larger than the mesothorax. Wings none. Abdomen ovoid, attached by a short peduncle, acute at the apex which is slightly incurved, and armed with a sting, 2nd and 3rd segments very large. Legs strong. Coxæ large. Thighs a little robust. Tibiæ; anterior with a long pectinated spine at the apex. Tarsi long, 5-jointed, basal joint very long, 4th smallest. Claws bent and acute (8).

ICHNEUMONIDES Lat. *Hist. Nat.* v.13. p. 269.—Curtis's *Guide*, Gen. 666.
—*formicaria* Jur. pl. 13.

Female. Bright ochraceous, shining with scattered punctures and pubescence. *Antennæ* fuscous towards the apex. Head and abdomen black, the latter ochreous and hairy at the apex. Legs hairy, base of the thighs and tips of the tarsi rather piceous.

In the Cabinet of the Author.

1st of female in 52251 in one coll. Parasite of Cicindela.

THE only British insects with which *Methoca* might be confounded are the females of *Mutilla* and *Myrmosa*, and the apterous *Ichneumonidæ* (*Pezomachus* Grav.); the peculiar form of the thorax will however at once distinguish our insect from the rest; and it is further separated from the females of the first by the ocelli, and from the *Pezomachi* by the fewer joints of the antennæ, independent of the 6-jointed maxillary palpi and other differences in the trophi.

The specimen from which the drawing was made is, I believe, the only British one discovered, and has never been recorded as a native of this country, excepting in the Guide. I took it the 30th July 1828, running upon a mass of sand-stone ascending Black-gang Chine in the Isle of Wight. I looked in vain for another, and was not more successful in my search for the *Tengyra Sanvitali*. It is to the liberality of a most zealous and distinguished entomologist at Lyons, Mons. Foudras, that I am indebted for a specimen of this insect to dissect, as well as for the *Tengyra* and other rarities.

Latreille says that the *Methoca* is found running upon the ground in fields in the South of France, but very rarely: Mons. Foudras has taken it near Lyons with *Tengyra Sanvitali*, which he believes to be the male, and the same opinion having been entertained I believe in the 7th vol. of the *Annales du Musée*, I shall subjoin the characters, partly from Latreille's *Gen. Crust.* v. 4. p. 116, with additions from my own observation.

TENGYRA.

Antennæ of the male shorter than the body, subsetaceous, composed of 13 joints, the 2nd very minute.

Ocelli three.

Mandibles bidentate.

Palpi, maxillary long, the joints unequal.

Labium truncated at the apex, subemarginate (trifid, lateral laciniae very short?).

Mentum with the apex subacuminate in the middle.

Wings, superior with the marginal cell closed, nearly touching the apex, narrow, subelliptic, and acute, 3 perfect submarginal cells, the 1st and the 2 discoidal cells long.

Abdomen elongated and narrow, subfusiform, the annulations slightly coarctate.

Feet short and slender.

SANVITALI Lat.

Black, shining, pubescent: clypeus carinated; trunk punctured, mesothorax rugose; stigma and nervures piceous; abdomen very shining.

Found in Etruria, in the fields of Piedmont, and near Paris and Lyons.

The plant is *Galium cruciatum* (Cross-wort or Mug-weed).



664.

- TIPHIA MINUTA.

ORDER Hymenoptera.

FAM. Scoliadæ.

*Type of the Genus, Tiphia femorata Fab.*TIPHIA *Fab., Lat., Panz., Jur., Vand. L., Shuck., Curt.*—*Bethylus Panz.*

Antennæ inserted at the base of the clypeus, approximating, a little longer than the head, filiform or subfusiform, a little curved and 13-jointed in the males, basal joint the stoutest, subovate, 2nd small, cup-shaped, 3rd a little larger, the remainder subquadrate, apical joint a little longer and ovate-conic; more curved and 12-jointed in the female, the apical joint considerably longer than the 11th (1).

Labrum small, concealed under the clypeus, pocket-shaped, the anterior margin ciliated or pectinated with long stout spines, the 2 central ones very long (2).

Mandibles crossing, long, rather slender, curved and acute, hairy outside (3).

Maxillæ with a horny base and a large hairy lobe on the inside.

Palpi attached to the upper margin of the horny portion, long, hairy, and composed of 6 unequal joints, 1st joint bent at the base, 2nd and 3rd the stoutest, cleaver-shaped, the former the shortest, the following long and subclavate, tapering, the apical joint being the slenderest and conical at the point (4).

Mentum top-shaped, hiding the *Lip*, which is very short. *Palpi* stout hairy and 4-jointed, basal joint the slenderest, clavate with a spine outside, 2nd truncated obliquely, 3rd more pear-shaped, 4th ovate-conic (5).

Head transverse, not broader than the thorax; face orbicular; eyes lateral ovate: ocelli 3 in triangle on the crown. Thorax ovate, collar ample; scutellum lunate; metathorax truncated. Abdomen ovate-conic, basal joint campanulate, petiole short and stout with a tooth on each side. Wings, superior with one marginal, 2 submarginal and 3 discoidal cells, the 1st complete in the male, open in the female (9) with the apex of the wing notched. Legs short and stout, very spiny and hairy in the female (8): thighs, posterior very short, incrassated and compressed in the female: tibiae short, with long slender spurs and series of short thick spines outside the 4 posterior in the female: tarsi rather short and 5-jointed, tapering and very bristly in the female: claws short and bifid. (8, a fore leg.)

MINUTA *Vand. Lind.*—*Curt. Guide, Gen.* 667. 3.

In the Cabinets of Mr. Dale, Mr. Shuckard, and the Author.

THE Scoliidæ form a very extensive family inhabiting warm latitudes and the tropics. On the sandy shores of the Mediterranean, especially near Frejus, I found a considerable number of species, but none inhabit Great Britain or the North of Europe that I am aware of, excepting the genus *Tiphia*, for *Sapyga*, pl. 532, is evidently a distinct family, and *Tengyra*

1 of a fault 6. 830 3 5 et una coll

being the male of *Methoca*, pl. 329, must be united to the Mutillidæ.

The male *Tiphia* are often found resting on the ground, especially in sandy districts, and the females frequent umbelliferous and other flowers. The difference in the marginal cell, which is closed in the male, as shown in our coloured figure, and open in the female, as represented at fig. 9, forms a remarkable character in this group.

1. *femorata* Fab.—Panz. 53. 3.—Jur. pl. 9. Gen. 11.—villosa Fab. ♂.—Panz. 98. 16.

Black, shining, pubescent, metathorax with 3 elevated lines, the central one abbreviated, legs rufous in the female, anterior pair brown; wings pale reddish-brown: length $2\frac{1}{2}$ to 5 lines.

Latreille says this insect makes its nest in the earth at the end of summer. It is a common and variable species; sometimes the legs are red in the male and black in the female.

Taken in Norfolk, Birch Wood, the New Forest; August, Parley and Charmouth, Mr. Dale; on the beach at Bourne-mouth, the Honourable C. A. Harris; and on flowers near Dover in July, J. C.

2. *Morio* Fab.?—Panz. 55. 1.

“Black, villose and punctured; apex of the mandibles rufescent. The metathorax rugose, without the longitudinal elevated lines; the wings with their stigma very large, and their nervures piceous. The abdomen very villose and shining: length 5 lines.” Shuck.

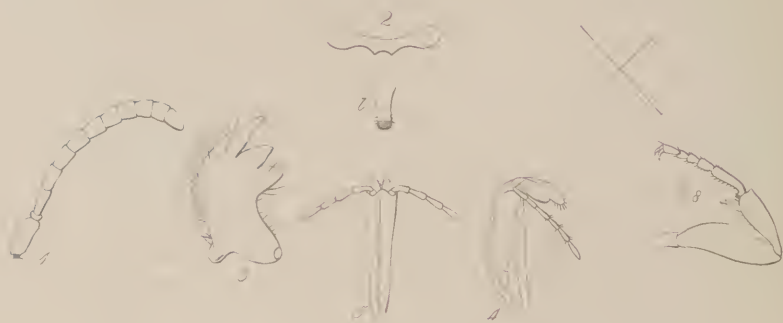
The male in the British Museum is believed to have been taken in Devonshire by Dr. Leach. The Fabrician specimen was from Spain.

3. *minuta* Vand. Lind.—Curt. Brit. Ent. pl. 664. ♂.

Male. Intense black; shining and pubescent; palpi brown, apex of mandibles ferruginous; metathorax with 3 complete elevated lines; abdomen very finely punctured: wings stained brown; nervures deeper, stigma large ovate and piceous; apex of anterior tibiæ ferruginous, their tarsi more ochreous, tips of the other tibiæ and all the tarsi sometimes ferruginous; spurs whitish: antennæ reddish brown beneath in the female, mandibles rufous only at the middle; apex of abdomen pitchy-red.

The neururation of the wings varies greatly in this little species, as shown by Mr. Shuckard, who has taken several specimens on Hampstead Heath, and Mr. Dale finds it in abundance at Glanville's Wootton on grass and laurels, from the end of March to June. He informs me that he took a 4th species on the sand-hills at Braunton Burrows in Devon the end of July. I observed the male of *T. femorata* in considerable numbers on the sand-hills at Boulogne the end of August, but not one female!

The Plant is *Thalictrum minus*, Less Rue-weed, from Arncliffe, communicated by Mr. T. Howson.



SAPYGA CLAVICORNIS.

ORDER Hymenoptera.

FAM. Sapygidæ.

Type of the Genus, Scolia 5-punctata Fab.

SAPYGA *Lat., Jur., Klug., Van Lin., Curt.*—*Hellus Fab., Panz.*—*Masaris Panz.*—*Scolia and Sirex Fab.*—*Vespa Geoff.*—*Apis Linn., Don.*

Antennæ remote, inserted near the middle of the face, as long as the head and thorax, clavate, especially in the males, and 13-jointed: 12-jointed in the females (1), basal joint the longest and stoutest, 2nd cup-shaped, 3rd slenderer, the remainder gradually increasing in diameter and decreasing in length, the 11th joint being nearly quadrate, 12th short and ovate.

Labrum minute and concealed beneath the clypeus, forming a tongue-shaped membranous lobe, coriaceous and ciliated at the apex (2 1).

Mandibles a little porrected, very hairy, slightly curved, with 3 strong teeth in both (3).

Maxillæ rather long, terminated by an ovate incurved lobe, with a notch on both sides near the apex, which forms an ovate lobe, ciliated with strong bristles. *Palpi* much longer than the lobe, slender and 6-jointed, the 2nd being the shortest and the 3rd a little the longest (4).

Mentum long linear and slightly compressed. *Labium* composed of 2 short pointed and pubescent lobes. *Palpi* bent back, composed of 4 clavate joints of nearly equal length, the apical one being fusiform (4).

Clypeus sinuated, and bidentate at the centre (2): head thick and orbicular, with an elevated line between the antennæ: eyes lateral the inner margin notched: ocelli 3 in triangle on the crown of the head. Thorax elongate-ovate sloped and rounded behind, anterior margin truncated and a little concave, collar forming a perfect band: scutellum semiovalate. Abdomen very much narrowed at the base, elongate-ovate, conical at the apex, female armed with a sting. Wings, superior with 1 marginal, 4 submarginal and 3 discoidal cells. Legs simple, rather short and slender: thighs short: tibiæ, anterior short and clavate, with a bifid compressed spine at the apex, the others with a pair of acute spurs: tarsi attenuated, 5-jointed, basal joint the longest, 4th minute: claws with a small tooth beneath: pulvilli minute (8, a fore leg).

CLAVICORNIS *Linn.*—*prisma Fab.*—*Curt. Guide, Gen. 668. 2.*

In the Cabinets of Mr. Shuckard, the Author, &c.

SAPYGA is a remarkable Insect; its ample collar reminds us of the Chrysidæ, but in general aspect as well as in the shape of the palpi and the form of the maxillary lobe, rounded and reflected, we cannot fail from drawing a comparison with *Hylæus* (pl. 373) and the Andrenidæ: it appears, however, to be most related to the Mutillidæ and Scoliidæ, and like them the females have the power of stinging very acutely.

Dr. Klug says these Insects frequent flowers in meadows

176. 133 31. parash + Eucalis, Manducating, seen on a bush

and fields and fly swiftly : there are only 2 species inhabitants of England, although from the sexes being so very dissimilar in one, and the body of the male varying greatly in the number of the spots, they have been described by Fabricius and others under a variety of names, as

1. *S. 4-guttata* *Fab. Spec. Ins.*—*6-guttata* *Fab. Ent. Syst. var.*
—*6-punctata* *Fab. Syst. Piez.*—*10-guttata* *Jur. pl. 9. f. 13.*
—*4-punctata* *Panz. 87. 20.* ; Males.—*5-punctata* *Fab. Spec. Ins.*—*Pacca* *Fab. Mant. Ins.*—*5-guttata* *Don. 13. 438.* ; females.—*punctata* *Klug. Mon. tab. 7. fig. 4, 5, 6.*—*Panz. 100. 17?* of this reference I am doubtful, and there are too many joints in the antennæ.

Male black ; antennæ with a few of the central joints ferruginous beneath ; clypeus and a stripe on the anterior tibiæ white ; 3rd and 4th, and sometimes the 2nd and 5th segments of the abdomen with a white spot on each side, with similar spots occasionally on the underside. *Female* often having 3 white dots on the head, and one on each shoulder, 2nd and 3rd segments of abdomen rufous, 4th and 5th with a white spot on each side, 6th with one at the apex.

I never saw so many of this insect as on the 11th of June, at Ambleside, in company with Mr. Dale, when the females were flying about the stone walls in plenty ; but the males were comparatively rare, and were settling on the ground at the base of the walls : I have found this sex also at the back of the Isle of Wight ; Mr. Donovan took it at Faversham in Kent ; Mr. Walker at Southgate in July ; and Capt. Blomer in the New-forest.

2. *S. clavicornis* *Linn. Faun. Succ. n. 1686.*—*Curt. Brit. Ent. pl. 532* ♂.—*prisma* *Fab.*—*Klug. tab. 7. f. 7* and *8.*—*cra-broniformis* *Panz. 47. 22* ♀.

Male black, very thickly punctured and pubescent, antennæ long and clubbed, underside, excepting the 3 basal and 2 apical joints, ochreous ; clypeus, a dot on each shoulder, a dot at the apex, 2 spots on the 2nd segment and an interrupted band on the 3rd and 4th, yellow, a stripe on the outside of the anterior, and a spot at the base of the other tibiæ of the same colour. *Female* with the clypeus black, 2 yellow dots between the antennæ, which are clavate only, and the apical joint alone ferruginous beneath and at the tip : wings dusky ; abdomen similar to the male, but with 4 yellow spots beneath.

I am happy in being able to restore Linnæus's name to this species, the specimen contained in his cabinet being a male, with a label of his own writing.

Females were observed by Mr. G. Newman in the autumn, in considerable numbers, settling on the leaves of a *Morella* cherry-tree in a garden near Leominster, and also by Dr. Howitt near Nottingham : for the loan of the male I am indebted to Mr. Shuckard, who has also obligingly added the other sex to my Cabinet.

The Plant is *Hieracium Pilosella* (Mouse-ear Hawk-weed).



Chalcidius (Chalcidius) sp.

POMPILUS RUFIPES.

ORDER Hymenoptera. FAM. Pompilidæ Lat., Leach.

Type of the Genus Pompilus viaticus Fab.

POMPILUS Fab., Lat., Panz., Jur.—Sphex Linn., DeG.—Psammocharus Lat.

Antennæ inserted between the eyes, below the middle of the face, curved, filiform and 13-jointed in the males (1), basal joint large, 2nd minute, the remainder slightly decreasing in length to the end, the terminal joint being subovate; attenuated convoluted at the apex and slightly serrated in the females, 12-jointed, the 3rd joint the longest.

Labrum scarcely exerted, short and broad, anterior margin concave, the angles truncated and very pubescent, the front producing long and rigid bristles (2).

Mandibles slender, internally concave, pilose on the outside, 2 teeth on the inner margin towards the apex, stronger in one than in the other (3).

Maxillæ broad and much longer than the mentum and lip, terminated by 2 lobes, the lower one ciliated, the terminal one large rounded and pilose outside. *Palpi* very long, 6-jointed, basal joint small, the 3rd the most robust, the others nearly as long, the last the slenderest (5).

Mentum obovate, producing a few bristles towards the top. *Palpi* long (but shorter than the maxillary), 4-jointed, basal joint the longest subclavate, 2nd scarcely so long, 3rd and 4th shorter, of equal length, obovate. *Labium* very short. *Paraglossæ* rather longer than the lip, slightly hooked and pilose (5).

Males much smaller than the females. Head transverse, orbicular. Eyes remote. Ocelli 3 in triangle. Thorax oblong; *postscutellum* rounded. Abdomen sessile, slender and subfusiform in the males; conical robust and armed with a sting in the females. Superior wings with 1 marginal and 3 submarginal cells, the stigma nearly obsolete. Legs long, first pair the shortest. Thighs of the 1st pair attenuated to the apex. Tibiæ short and furnished with very long spurs: Tarsi long 5-jointed, basal joint considerably the longest, 4th the shortest. Claws somewhat bifid and ciliated internally. Pulvilli large (8, a fore leg.)

RUFIPES Linn. Faun. Suec. p. 413. n. 1659.

Black, with hoary pubescence. Abdomen smooth and naked, slightly pubescent only at the base and apex; the males with 2 cream-coloured spots at the base of the 3rd segment; the females with 2 also at the base of the 2nd, and rarely with one on each side of the 4th; an apical spot of the same colour. Wings dusky, fuscous at their extremity. Thighs of intermediate legs ferruginous at the tips, the posterior legs with the thighs and tibiæ bright ferruginous, the former black at the base. Anterior tarsi of the females ciliated externally with long moveable lancolate bristles.

In the Author's Cabinet.

1st female. No. 57. paratype of the female, E. gibbosa, E. viaticus. Fenton Nat. Hist. Soc., n. 121, 24, 157, 197/8, 162, 369/70, 121, 33, 34

THE Pompili inhabit sandy situations exposed to the sun; and we learn from Latreille that they bury a spider or caterpillar in a cell formed in such places, and close the aperture, having previously laid an egg, which is nourished when hatched by the insect inclosed with it.

The Pompili (as the same author observes) are very active, they are continually flying from one place to another; they run also very rapidly, and often vibrate their wings and antennæ. The reader will be amused by referring to Kirby and Spence, vol. i. p. 339 or 344.

The following is the best list that has appeared of our native species, but there are probably eight or ten more unnamed: those with * have never before been recorded as British.

1. *fuscus* Fab.—Panz. 65. 15.—June; common every where.
2. *gibbus* Linn.—Panz. 77. 13.—June to end of Aug. ditto.
3. *exaltatus* Fab.—Panz. 86. 10.—June to b. Aug.: sandy paths amongst heath.
4. *viaticus* Fab.—Panz. 65. 16.—June to b. Sept.: sandy places, and amongst heath and rushes.
- *5. *pulcher* Fab.—Coq. t. 12. f. 8.—m. Aug.: gravelly paths, Ramsdown, Hants, discovered by the Honourable C. A. Harris.
- *6. *niger* Fab.—Panz. 71. 19.—e. Aug., Sept.: Branton-burrows, Devon, and Isle of Wight.
7. *hircanus* Fab.—Panz. 87. 21.—m. May: Coomb Wood.
- *8. *rufipes* Linn.—Panz. 65. 17.—This very distinct and handsome species has been added to our Fauna by the Honourable Charles A. Harris, who took it at Ramsdown near Heron Court, Hampshire; and having kindly presented me with specimens, and taken me to the spot where they were found, I had the pleasure of capturing the beautiful variety of the female represented in the plate.
- *9. *bipunctatus* Fab.—Panz. 72. 8.—*tripunctatus*? Coq. t. 3. f. 10.—In the British Museum.
10. *annulatus* Fab.—Panz. 76. 16.—Sam. Ent. Comp. p. 274.
- *11. *punctum* Fab.—Panz. 86. 12.

The pretty plant figured, *Chironia Centaurium* (Common Centaury), was in flower at the time the insect was taken.



- CEROPALES VARIEGATUS. ^{1/}

ORDER Hymenoptera.

FAM. Pompilidæ.

Type of the Genus, Ceropales maculatus, Fab.

CEROPALES Lat., Fab., Jur., Van Lin., Shuck., Curt.—Pompilus Panz.—Ichneumon Geof.—Evania Fab.

Antennæ inserted in the middle of the face, approximating, not much longer than the thorax, filiform, simply curved in both sexes and indistinctly articulated, 13-jointed in the male, 12-jointed in the female (1), basal joint short, stout and ovate, 2nd small, cup-shaped, the following oblong, 3rd not longer than the 4th, terminal joint ovate.

Labrum exserted, semiorbicular, cilia fine and short (2).

Mandibles slender, curved and bifid, the inner tooth small, pilose and slightly bristly outside (3).

Maxillæ terminated by a broad bristly rounded lobe. *Palpi* long pubescent and 6-jointed, basal joint not very short, pyriform-truncate, 2nd longer and stouter, 3rd the stoutest and as long as the following which are slenderer, apical joint rounded at the tip (4).

Mentum short, rhombiform. *Palpi* short and attached on each side of the anterior margin, pubescent and 4-jointed, joints nearly equal, elongate-obovate, 2nd truncated obliquely, 4th ovate-conic. *Lip* large orbicular, slightly ciliated (5).

Head transverse, as broad as the thorax: eyes lateral, moderate, ovate: ocelli 3 in triangle on the crown. Thorax oblong; collar angulated: scutellum gibbose, semioval. Abdomen short, narrowed at the base, sometimes elliptical and narrower than the thorax in the male, the apex truncated; stouter and ovate-conic in the female: ovipositor visible and elevated. Wings, superior with 1 marginal and 4 submarginal cells, the 2nd and 3rd receiving each a recurrent nervure. Legs, anterior short, hinder very long: coxæ large: thighs moderate: tibiæ, anterior with 1, the others with 2 rather long spurs at the apex: tarsi very long, simple in both sexes, basal joint the longest, 4th the shortest: claws curved acute: pulvilli large, undivided (8, a fore leg).

VARIEGATUS Fab.—Curt. Guide, Gen. 670. 3.

In the Cabinets of the British Museum and Mr. Rudd.

THE females of this genus are readily distinguished from those of *Pompilus* (pl. 238) by their antennæ, which are not convoluted, but simply curved like those of the male; the anterior feet are also simple, and not ciliated with long spiny bristles, and the ovipositor is a little exserted; the males are less easily separated, but on an examination of the trophi, very decided differences will be found in the labrum and mandibles.

1/4 female. No. 91157, Yorkland 218/22,

The *Ceropales* are supposed to be parasitic, depositing their eggs in the larvæ of other fossorial Hymenoptera.

1. *maculata* Fab.—*frontalis* Panz. 72. 9. ♀.

Black: clypeus and labrum in the male, and orbits of eyes in the female cream-colour: a band on the collar and a spot on the scutellum of the same colour: 1st abdominal segment with 2 cream-coloured spots, margin of the 2nd and apex white: legs ferruginous; coxæ, hinder thighs and apex of tibiæ and tarsi more or less brown.

Middle of August, Norfolk, and Heron Court, Hants, on umbelliferous flowers; also in Kent, Surrey, and Wales as late as September, Mr. F. Walter.

2. *semiannulatus* Curt. *Guide*, No. 2. Length $2\frac{3}{4}$ lines.

Black, inner orbits of eyes, margin of 2nd abdominal segment, interrupted in the centre, and apex cream-colour: legs rufous, coxæ, trochanters, base and apex of the 4 posterior thighs and terminal half of hinder tibiæ black, tarsi brown.

This female was taken by me in Norfolk; it may prove to be only a small variety of *C. maculata*.

3. *variegatus* Fab.—Curt. *Brit. Ent. pl.* 756. ♂.

Male black, smooth, exceedingly minutely and thickly punctured, slightly silky with short pile: 2 basal joints of antennæ beneath and face cream-colour, the latter with a black stripe under the antennæ, a dot on each side of the collar, and the hinder margin, as well as a spot behind the scutellum, of the same colour: metathorax whitish with pile: 2 basal segments of abdomen rufous, 2nd with a sublunate cream-coloured spot on each side of the margin, and 2 dots at the apex: wings yellowish-brown on the disc: stigma and nervures piceous: legs bright rufous: coxæ black, hoary sericeous, with a cream-coloured spot on the outside of each; trochanters blackish, tips of hinder thighs and tibiæ and the tarsi brownish, basal joint of the hinder feet ciliated internally.

Supposed to have been first captured by Dr. Leach in Devonshire, and a pair has since been taken near Parley Copse and Catherine-hill, Hampshire, in August, by the Rev. G. T. Rudd, to whom I am indebted for the loan of the male.

Lagurus ovatus, Hare's-tail-grass, from Guernsey, was obligingly communicated by S. H. Haslem, Esq.



- AMMOPHILA CAMPESTRIS.

ORDER Hymenoptera.

FAM. Sphægidæ.

Type of the Genus, Sphex vulgaris Linn.

AMMOPHILA Kirb., Lat., VandL., Curt.—Miscus Jur.—Sphex Linn.

Antennæ inserted in the middle of the face, approximating, not longer than the thorax, generally curved at the apex, slender and filiform; 13-jointed in the males (1 ♂), basal joint stout, ovate, hairy beneath, 2nd small, globose, 3rd the longest, the remainder elongated, slightly decreasing in length, attenuated at the apex, which is truncated and hollow; 12-jointed in the females (♀, the 2 terminal joints).

Labrum incurved, semiorbicular, ciliated with short bristles, the front emarginate, with a few long straight hairs (2).

Mandibles long, slender and crossing, arcuated and dilated in the middle and subtridentate, having an ovate tooth at the centre and a small one beneath, with a portion more or less produced above, the remainder forming a long tooth, often acute (3).

Maxillæ elongated, terminating in a very long horny linear lobe, attenuated towards the apex, which is rounded and ciliated, with an incurved spine. *Palpi* attached near the middle and extending a little beyond the lobe, 6-jointed, first 3 joints the stoutest, clavate, basal one the shortest, 2nd and 3rd the longest, 3 following slender, decreasing in length, the apical one spatuliform and scarcely longer than the first (4).

Mentum elongated, narrow, a little dilated at the middle (5).

Lip very long, nearly linear, hollow, transversely striated and pubescent beyond the middle, cleft at the apex. *Paraglossæ* long and lanceolate (d). *Palpi* long, but much shorter than the lip, attached to 2 membranous scapes, arising from the apex of the mentum, slender and 4-jointed, first 3 joints very long, 2nd a little the longest, 4th shorter subelliptic.

Trophi inflected, rostriform. Head as broad as the thorax: faces of the males clothed with silvery hairs: eyes lateral and elliptic: ocelli 3 in triangle. Thorax ovate, the collar narrowed, sometimes forming a thickened ring: scutellum sublunate: metathorax large, cylindric-ovate. Abdomen 8-jointed in the male, with a slender petiole longest in that sex, the 2nd joint sometimes slender, the apex somewhat bilobed (6 ♂); 7-jointed in the female (♀), the apex armed with a sting inclosed between 2 lobes. Wings with one short marginal and 3 submarginal cells (9*), the 2nd receiving 2 recurrent nervures, the 3rd rarely peduncled. Legs, especially the anterior, which are the shortest, most spiny in the females, the others long: tibiæ spiny, hinder the longest, the apex armed with strong spines, the anterior with one curved dilated and notched internally, 2nd pair with the spines serrated internally, hinder with one long spine, pectinated on the inside (8 †, apex of tibia and base of tarsus): tarsi long, very spiny and 5-jointed, basal joint of the 1st and 3rd pair of tarsi notched beneath at the base, especially the 1st, and ciliated.

CAMPESTRIS Lat.—pubescens Curt. Guide, Gen. 672. 5.

NATURAL as this group is, there are many variations in the structure of the species: the trophi are less elongated in the female of *A. hirsuta* than in *A. sabulosa*, and the mandibles are

of a female ♂: 5653; Further notes on the subject.

obtuse: the petiole of the abdomen varies considerably in length and form, even in the sexes, and in one species the 3rd submarginal cell is pedicled: this forms a portion of Jurine's *Miscus*, but I cannot think it advisable to establish this genus on such slender grounds.

The œconomy of these insects is very remarkable, and although well known I shall add a few lines from my own observations. On the 26th of August I saw a female *A. sabulosa* ascend a sandy bank, dragging a caterpillar, which it carried beneath it as the trunk of a tree is suspended under a *Gill*, holding it near the head with its jaws: having arrived at the desired spot it left the caterpillar, and proceeded about an inch to a place covered with sand, which it scratched away, and then with astonishing dexterity removed, and with its jaws drew out of a hole, comparatively large pieces of earth that closed and concealed the orifice; some of these were so far in that it had to go beyond its own length, of course backing out every time: having completed this operation, it seized the larva and went backward into the hole, drawing the caterpillar quite down; after a short time the fly came out, and being frightened, it flew away. On the following day the Hon. C. Harris and myself saw another larva entombed; it was a *Geometra* $1\frac{1}{2}$ inch long; that yesterday was a *Noctua*, probably *meticulosa*: having buried it the fly remained in the cell. We then dug out the caterpillar, and found a cylindrical white egg $\frac{1}{8}$ th of an inch long, attached firmly to the middle; the *Ammophila* was below and came out much alarmed.

Mr. Kirby was acquainted with the male of one species only when he characterized this genus, and my ignorance of that sex led me into several errors in the Guide.

- I. Petiole of abdomen elongated and formed gradually:
a. 3rd submarginal cell pedicled.

1. *campestris* Lat.—*Curt. Brit. Ent. pl.* 604 ♀.

Dead black, clothed with short grey pubescence, giving the apex of the metathorax and the outside of the hinder coxæ a silvery appearance: sparingly punctured: metathorax very finely striated transversely, 2nd joint of abdomen, excepting the base, 3rd joint and base of the 4th orange; costa, disc of cells and the fimbria yellowish-fuscous, scapulars, stigma and nervures brown. The male has a silvery face, the entire upper side of the 2nd joint of the petiole and a long ovate spot on the back of the 3rd segment black.

I discovered the female in Norfolk 20 years since, and the male I took at Ramsdown, near Heron Court, the end of Aug.

- b. 3rd submarginal cell simple.

2. *sabulosa* Linn.—*Panz.* 65. 12 ♀.—*vulgaris* Kirb.—*lutaria* *Panz.* 65. 14 ♂.—*Don.* 3. 93. 1 ♀.—*pulvillata* Sow.?

- II. Petiole of abdomen shorter and formed abruptly.

3. *affinis* Kirb.—*Linn. Trans.* v. 4. p. 205. No. 2.

4. *hirsuta* Scop.—*Sow. B. M. pl.* 33. f. 1.—*Sam. Ent. Comp. pl.* 8. f. 5.—*arenaria* Fab.—*Panz.* 65. 13.—*Don.* 13. 468. 2. *females*.—*argentata* Kirb.—*lutaria* Fab. *males*.

The Plant is *Tussilago Petasites* (Common Butter-bur.)



Chamaecrista nictitans

A SOLITARY example in the British Museum, and another in Mr. Donovan's collection, were the only specimens preserved of this insect, and nothing was known of its habits or locality; I was therefore highly gratified last summer, by capturing several of both sexes; they are exceedingly active; and Latreille says they are called *Astatae*, because they are always in motion.

On a fine day, the end of last July, whilst rambling about the undercliff at the back of the Isle of Wight, I observed two males on a pathway leading through heath and rushes; a few days after, I found two more males on sandy spots near the same place; and on the 12th of August, a young friend who was my companion, took a female at the top of the cliff; and towards the latter end of the same month, on a gravelly walk at Ramsdown, surrounded by heath, rhododendrons and pine-trees, I took four females, each of them carrying a pupa of *Pentatoma prasina*, Linn.; or of *P. dissimilis*, Fab.: and as nothing was known of their œconomy, it was an interesting and remarkable fact; and there is scarcely a doubt but these pupæ were to be buried by the *Astata* to deposit her eggs in. The Honourable Charles Harris also took one or two, which I believe were females also.

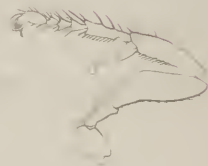
The trophi are remarkable, especially the 2nd joint of the labial palpi; and the upper lip with its long spines, some of them furcate. Latreille says the labium is trilobed; and as his accuracy is beyond all praise, I suspect that it is different in the males, mine being a female, which was bilobed. The anterior tarsi of the females are furnished with the same sort of appendages as the *Pompili*, perhaps to secure their prey, or to assist them in clearing away the sand in burrowing.

Panzer says his *T. abdominalis* has whitish tarsi, and his figure is so represented; and his *D. stigma* has the anterior tibiæ annulated with white. I have therefore been compelled to give my insect a new name; for Mr. Donovan (who has figured the male, which is the reason that the female is now given) has called his the *Larra pompiliiformis* of Panzer, which is not of the same genus. The *D. oculata* of Jurine is also perfectly distinct.

The plant is *Trifolium (Melilotus) officinale* (Melilot Trefoil).



Hedysarum longicaule Ledeb.



OXYBELUS ARGENTATUS.

ORDER Hymenoptera.

FAM. Larridæ.

Type of the Genus, Vespa uniglumis Linn.

OXYBELUS Lat., Fab., Panz., Jur., Curt.—Vespa Linn.—Crabro Fab.

Antennæ inserted at the base of the clypeus, short, curved, clavate, geniculated and pubescent, 13-jointed in the males and 12-jointed in the females (1); basal joint rather long and very stout, 2nd much smaller and cup-shaped, 3rd longer than the 2nd, 4th shorter, the remainder cup-shaped or subquadrate, terminal joint ovate.

Labrum small lunulate, ciliated, producing a few long hairs (2). *Mandibles* long slender curved and acute with a triangular notch on the inside towards the base; externally hairy and ciliated internally (3).

Maxillæ terminated by an incurved ovate lobe, the apical margin ciliated, and a small lobe on the inside. *Palpi* rather short, slender, pubescent, pilose and 6-jointed, basal joint small, the remainder nearly equal, the 5th a little shorter than the terminal one which is elongate-ovate (4).

Mentum quadrate at the top, the anterior margin sinuated, with a spine in the middle, base obovate, forming an angle on each side. *Palpi* rather long slender and pubescent, attached to small scapes, 4-jointed, basal joint the longest, clavate, the remainder nearly of equal size, the terminal joint ovate. *Lip* subquadrate and slightly emarginate (5).

Head *transverse*, face *orbicular*: clypeus with a deep keel in the centre in the males: eyes lateral long and narrow: ocelli 3 in triangle on the fore part of the head. Thorax globose, rather broader than the head: collar short: (T, the thorax in profile): scutellum trispinose, the lateral spines squamose (a), the central one the longest acuminate curved and grooved above (b). Abdomen not larger than the thorax, ovate-conic and 6-jointed. Wings; superior with 1 long marginal cell having the nervure continued from the apex, and 2 submarginal cells, the 1st of these being separated from one of the discoidal cells by a faint nervure: inferior wings with one transverse nervure very close to the base. Legs stout: thighs thick, short and ventricose: tibiæ short clavate and spurred at the apex and spined outside: tarsi longer than the tibiæ, the anterior with spiny bristles outside and serrated with smaller ones internally; 5-jointed, basal joint the longest, 4th minute, 5th thick and ovate. Claws curved and acute; pulvilli large and ovate (8, a fore leg).

ARGENTATUS Matt. MSS.—Curt. Guide, Gen. 681. 6.

Black, completely clothed with depressed silvery hairs and thickly punctured; scutellum with the lateral lobes and the apex of the curved spine yellow. Abdomen ovate-conic, with a yellow spot on each side of the first 4 segments, the 1st pair transverse oval, the 2nd and 3rd linear, the 4th united. Nervures of wings and legs ferruginous; anterior thighs black, yellow at the apex, the others black only at the base; anterior tibiæ yellow outside, the others only of that colour at the base: Pulvilli blackish.

In the Cabinets of the British Museum and Mr. Matthews.

1/1000 of a grain 6.875 grains 1/1000 of a grain 2.000/1000

LATREILLE distinguishes *Oxybelus* from *Astata* (pl. 261) and Nysson by a difference in the number of the cubital or sub-marginal cells, and the remarkable trimucronated scutellum is a striking character.

The males are smaller than the females, their bodies are narrower, the antennæ have a greater number of joints, and the clypeus, at least in the Type, has a projecting ridge, like a nose. Of their œconomy I am ignorant, but Latreille says they bury dead flies and lay their eggs close by them.

The following species have been detected in Britain.

1. *O. uniglumis* Linn. F. S. 1681.—Panz. 64. 14?—10-maculatus Don. 11. 376. 1. 1. var.

“Thorax immaculate: scutellum mucronate: abdomen with 8 white spots, the 2 basal ones ovate, the others linear: thighs black, tibiæ ferruginous.” The male has sometimes 10 spots on the abdomen, it is said.

On umbellate flowers in Kent. June and middle of August on sandy cliffs and footpaths in pairs, at the back of the Isle of Wight, also on sunny banks Pool Harbour: J. C. At Appledore, Dawlish, Bristol, Portland, Lulworth, Parley and Monkswood? J. C. Dale, Esq., from July to September.

2. *O. mucronatus* Fab. Ent. Syst. 2. 300. 25.

“Scutellum bidentate and mucronate, black spotted with yellow: all the abdominal segments with transverse yellow spots on each side: legs black, thighs yellow.”

Mr. Dale thinks he took this on Parley Heath, July 5, 1823.

3. *O. concinnus* Steph.—mucronatus Panz.? 101. 19.

4. *O. tridens*? Fab. E. S. Supp. 270. 24.—*Nomada punctata*, Fab. E. S.

“Scutellum black immaculate; all the abdominal segments with transverse yellow spots on each side: legs rufous, thighs black.”

I have taken a pair, I believe, of this species.

5. *O. trispinosus* Fab. E. S. 2. 301. 26.—*Lat. Gen.*, &c., tab. 13. f. 13.

“Scutellum black, abdomen with 2 yellow spots on each side: legs black, apex ferruginous.”

End of June, Wrentham, Suffolk.

6. *O. argentatus* Matt.—*Curt. Brit. Ent. pl.* 480. ♀.

The beautiful specimen figured was taken on the sand-hills near Liverpool in July 1831 by A. Matthews, Esq., of Lincoln College, Oxford, to whom I am indebted for the loan of it.

The Plant is *Hedynois* (*Apargia*) *hispida* (Rough *Apargia*).



TRYPOXYLON CLAVICERUM.

ORDER Hymenoptera.

FAM. Crabronidæ.

Type of the Genus, Spheg Figulus Linn.

TRYPOXYLON Lat., Fab., St. Farg., Shuc., Curt.—Apus Jur.—Spheg Linn.

Antennæ inserted under a little tubercle at the base of the clypeus, approximating, short, not geniculated, but curved, a little clavate, 13-jointed in the male (1 ♂), basal joint short stout and somewhat obovate, 2nd globose, 3rd slender oblong, the following gradually decreasing in length and increasing in diameter, becoming transverse towards the apex, the last joint long, curved and conical, 12-jointed in the female, scarcely clavate, the apical joint not curved.

Labrum concealed, the base elongate-trigonate, anterior portion forming two long broad parallel lobes, obtuse and ciliated with long hairs (2).

Mandibles long slender lanceolate and curved, broadest at the base, with a large angle on the inside, externally hairy (3 ♀); smaller and claw-shaped in the male, and regularly curved, not angulated internally (♂).

Maxillæ with a small lobe inside, terminated by a larger ovate one, ciliated outside. *Palpi* long, ciliated internally, filiform, composed of 6 joints of nearly equal length, basal joint a little the shortest, the following cleaver-shaped, 5th sometimes the longest, 6th very slender (4).

Mentum short broad and suborbicular, base truncated, the sides trisinuated, anterior margin straight. *Lip* very short and nearly concealed. *Palpi* neither long nor stout, pubescent, 4-jointed, 2 basal joints the longest, clavate, 3rd nearly ovate, 4th ovate (5).

Head transverse, face orbicular (1 ♀): eyes large vertical and deeply notched on the inside: ocelli 3 in triangle on the crown. Thorax globose: scutellum subquadrate, the basal angles produced. Abdomen very long, slender at the base, gradually becoming clavate, the apex incurved and acute. Wings, superior with one marginal and 3 sub-marginal cells, the nervures of the 2nd and 3rd as well as of the external discoidal cell but faintly traced (9). Thighs short and stout: tibiae, anterior very short, with a spine at the apex, the others spurred: tarsi 5-jointed, hinder long, terminal joint short and stout: claws and pulvilli thick.

CLAVICERUM St. Farg.—Curt. Guide, Gen. 682. 3. 2nd Edition.

In Mr. Shuckard's Cabinet.

TRYPOXYLON is considered to be allied on the one hand to *Tachybulus*, and on the other to *Nitela*, both of them European types, but not inhabitants of this country.

1/2 of the 6. 5. 5. 2. 149/152

1. *Figulus* Linn.—Panz. 80. 16.—Jurine pl. 9. Gen. 8.

Black, shining, clypeus and the margins of the segments silvery on the sides.

Authors do not seem to agree respecting the œconomy of this abundant species, which is found on old posts, paling, outhouses, gates, barn and stable doors, from the middle of May to the beginning of August, and in the Isle of Wight I have frequently found it upon rushes. Latreille says that it avails itself of the holes made by other insects in wood to form its own nest. As soon as the proprietor of the hole leaves it, the *Trypoxylon* takes possession of it, cleans, enlarges, and clothes the inside with a coat of diluted earth, places a spider (Mr. Westwood says the young of *Epeira diadema*) in it, deposits an egg, and then closes the aperture with moist earth; each cell occupies it two days. The larva is an apode and resembles those of bees: after having consumed its provision it spins a very thin cocoon, in which it becomes a pupa. This view has been confirmed by the observations of Mr. Shuckard and Mr. Westwood, but from the account of the œconomy of this insect by the latter gentleman in the Trans. of the Ent. Soc. he seems to be disposed to think that the *Trypoxylon* forms its own burrows. M. St. Fargeau considers that these insects are parasitic, and from an anecdote published in Mr. Shuckard's fossorial Hymenoptera it appears that Mr. Johnson detected them carrying masses composed of *Aphides* into the burrows occupied by *Odyneri*.

2. *aurifrons*. "Male black, silky-aureous, antennæ fulvous, margins of the abdominal segments ferruginous: 7 lines." Shuc. 117. 2.

Mr. Shuckard thinks this species, which is in the British Museum, may not be an European insect.

3. *clavigerum* St. Farg.—Curt. Brit. Ent. pl. 652. ♀.

Black, minutely punctured, clothed with short soft white pubescence, clypeus silvery in both sexes: metathorax striated obliquely, with a large channel down the centre: abdomen piceous, basal joint elongated, subpyriform, with a sharp groove down the base, the segments constricted at the base, sides of the margins silky-white: scapulæ and tips of thighs ochreous, 4 anterior tibiæ and tarsi ochreous, the former fuscous outside, except at the base and apex. In the male the legs are darker.

Mr. Shuckard obliged me by the loan of this insect, which he has taken at Hampstead and Darent; it has also been found at Camberwell: he adds that it frequents holes in posts and paling, especially where *Heriades Campanularum* (fol. 504) nidificates.

For specimens of *Polygonum viviparum*, Alpine Bistort, I am indebted to T. Howson, Esq., who took me to their locality in the neighbourhood of Giggleswick.

686



680.

CRABRO SUBPUNCTATUS.

ORDER Hymenoptera.

FAM. Crabronidæ.

*Type of the Genus, Sphex cribraria Linn.*CRABRO *Fab., Panz., Van. Lind., Shuck., Curt.*—*Pemphredon Fab.*

Antennæ inserted towards the bottom of the face at the base of the clypeus, approximating, a little longer than the head, geniculated, fusiform and 13-jointed in the male (1 ♂), basal joint stout, elongate obovate, hairy at the back, 2nd small, cup-shaped, 5 following dilated, 3rd semiovate, the following transverse, 8th, 9th and 10th narrower, serrated, the following slender subovate: filiform and 12-jointed in the female (1 ♀), basal joint long, rather stout, sublinear and hairy, 2nd ovate-truncate, 3rd much longer than any of the following which are oblong, a little thickened and truncated obliquely, apical joint longer and subconic.

Labrum attached under the clypeus, transverse, very short, forming a depressed triangle, the centre emarginate, ciliated and fringed with long hairs (2).

Mandibles long, crossing, a little curved, sublinear, the apex cleft, forming 2 broad rounded teeth (3).

Maxillæ short, terminating in a large concavo-convex ciliated lobe.

Palpi short, pubescent and 6-jointed, basal joint a little longer than the 2nd, which is ovate-truncate, slender and clavate, 3rd, 4th and 5th rather thick and a little cleaver-shaped, 4th the longest, 6th slender, subelliptic and at least as long as the 4th (4).

Mentum obconical. *Lip* very short, fleshy and pilose in the female (5), as long as the palpi and semicylindrical in the male (♂). *Palpi* short pubescent and 4-jointed, basal joint clavate, 2nd and 3rd somewhat obtrigonal, 4th small and ovate (5).

Head large and broad; face transverse-oval: eyes large ovate, remote above, approximating below: ocelli 3 in triangle on the crown. Thorax as broad as the head, obovate, collar narrow, the angles acuminate: scutellum transverse, semiovate. Abdomen very narrow at the base, as long as the head and thorax, ovate-lanceolate, 7-jointed in the male, 6-jointed in the female. Wings with 1 marginal cell, pedicled at the apex, and 1 submarginal. Legs short and stout: thighs stout: tibiæ short, spinose outside, with long spurs at the apex: tarsi as long as the tibiæ, slender, 5-jointed, externally spinose in the female, basal joint elongated, 3 following obtrigonal, 5th stout, elongate-clavate: claws short, acute: anterior legs patelliform in the male (8); coxæ stout (c); trochanters oblong (d); thigh with a minute spine at the base and a large dilated tooth on the outside (f), trigonal at the apex; tibia with a spur at the apex, and a large horny bowl-shaped dilatation on the outside, with transparent dots (l); tarsus short and thick, basal joint obtrigonal, 5 following saucer-shaped (t); claws very unequal, one small the other stout, curved and hooked at the base (u).

SUBPUNCTATUS Rossi.—*Curt. Guide, Gen.* 683. 18.—4-maculatus *Fab.* ♂.

In the Author's and other Cabinets.

1/ new & different to 501, 3 ex. with 1st and 2nd 152/203

CRABRO is a group of fossorial insects varying so much in structure, that MM. St. Fargeau and Brullé have formed them into 11 genera, the English types of which I shall subjoin, referring to the 3rd vol. of the Ann. de la Soc. Ent. for their characters. Mr. Shuckard has given a very able synoptic table, as well as elaborate descriptions of the species, a list of which will be found in the Guide. I wish to observe that the pellucid spots on the spoon of the masculine fore-legs are covered with a membrane, and it will be seen by the dissections of the trophi that there are ample grounds for establishing the genus *Rhopalum*. These insects are often found upon umbellatæ, and some of them undergo their metamorphoses in decayed trees. Latreille says that *C. cribrarius* provides for its larvæ with a *Pyralis* (Tortrix) that lives upon the oak: other females nourish them with Diptera.

CRABRO. 6. cephalotes *Fab.*

12^b. varus *Curt.*—comptus *St. Farg.*? v. 3. p. 705. 8.

Male black, minutely punctured and hairy: antennæ 13-jointed, with the 3rd and 4th joints dentate, scape yellow beneath, clypeus and inner margin of eyes silvery; crown convex: metathorax rugose: abdomen with 5 yellow spots on each side, the 1st pair, which is the largest, being on the 2nd segment; those on the 6th are united: legs black, anterior thighs with a yellow streak beneath in the anterior, the others with a spot at the apex; tibiæ black, intermediate slender and crooked, the others yellow outside; tarsi yellow, hinder brown, apical joint blackish: length 3 lines.

I took a male at Horning in Norfolk the 24th of June, and Mr. Shuckard has 2 from Scotland. The small size and crooked slender and black intermediate tibiæ, distinguish it from *C. Xylurgus*.

SOLENIUS. 19. vagus *Linn.*—*Panz.* 46. 10. ♀.

BLEPHARIPUS. 23. dimidiatus *Fab.*—signatus *Pz.* 43. 15 ♀.

CERATOCOLUS. 13. striatus *St. Farg.*—*Lindenius Shuck.*?

THYREOPUS. 4. cribrarius *Linn.*—*Pz.* 15. 19 ♀.—palmaris *Pz.* 46. 3 ♂.

THYREUS. 1. vexillatus *Pz.* 46. 5.—clypeatus *Fab.*

CROSSOCERUS. 2. scutatus *Fab.*—*Pz.* 15. 22. ♂.

18. subpunctatus *Rossi.*—*Curt. B. E. pl.* 680 ♀.

Male black, finely punctured; antennæ ciliated, base and tip of scape ochreous; mandibles castaneous at the centre; clypeus white with hair; metathorax with a shining cordiform space; 2nd and 3rd joints of abdomen with a large yellow spot on each side, 6th with 3 small yellow spots connected at the base: legs ochreous, yellow outside; anterior thighs black on one side, hinder legs black, the tibiæ with a yellow patch at the base, spurs ochreous. *Female* with 2 yellow spots on the collar: 5th segment of abdomen with a large yellow round spot; *var.* with a yellow streak behind the scutel and a sinuated one on the basal joint of abdomen, with broad yellow bands on the 3 following, the 5th joint entirely yellow.

LINDENIUS. 37. albilabris *Fab.*—leucostoma *Pz.* 15. 24.

DASYPROCTUS is an African genus, and CORYNOPUS and PHYSOSCELES form the genus *Rhopalum* of Brit. Ent. fol. 656.

Carum verticillatum, Whorled Caraway, from Newby Cross, was communicated by T. C. Heysham, Esq.



RHOPALUM TIBIALE.

ORDER Hymenoptera.

FAM. Crabronidæ.

Type of the Genus, Crabro rufiventris Panz.

RHOPALUM Kirb., Curt.—Physoscelus, Corynopus St. Farg.—Pempredon Fab.—Crabro Fab., Panz., Vand. L., Shuc.

Antennæ inserted at the base of the clypeus, approximating, scarcely longer than the head, geniculated, curved and simple at the apex; 13-jointed in the male (1), basal joint long and stout, 2nd ovate, 3rd the same length but truncated, the remainder quadrate, excepting the 6th joint which is oblong, emarginate beneath, and the terminal one which is elongate-conic: 12-jointed in the female, the 4th joint longer than the 3rd.

Labrum concealed beneath the clypeus, minute, transverse, the sides rounded, anterior margin convex and ciliated with strong bristles (2).

Mandibles rather long slender and curved, crossing over the labrum, hairy, broad at the apex and cleft, forming 2 trigonate teeth, equal in the male (3).

Maxillæ terminated by an inflected lobe, hairy outside. *Palpi* not long, pubescent, 5-jointed, basal joint minute, 3 following stout somewhat obovate, 4th longer than the preceding, but shorter than the terminal joint, which is slender and subfusiform (4).

Mentum elongate-trigonate, the anterior margin waved. *Labium* very short and concealed behind the mentum. *Palpi* attached to very minute scapes at the anterior angles, pilose, basal joint slender and clavate, 2nd stouter, somewhat obovate, 3rd a little the largest, ovate-conic (5).

Head large subglobose: eyes large lateral and ovate: ocelli 3 in triangle on the crown. Thorax oval: scutellum semiorbicular: metathorax smooth and convex. Abdomen petiolated, elongated, slender, clavate, basal joint long and slender, the apex nodose and larger than the base of the 2nd joint, the remainder forming an ovate mass. Wings, superior scarcely so long as the body, with a lanceolate marginal cell divided near the apex, one large submarginal and 2 discoidal cells. Legs rather short, hinder the longest and stoutest: anterior thighs very short: tibiae short simple and spurred, posterior stout clavate and spinose externally: tarsi 5-jointed, basal joint the longest and stoutest especially in the hinder pair: claws and pulvilli short and stout (8, a fore leg).

TIBIALE Fab.—Curt. Guide, Gen. 684. 1.—varicornis Panz.

In the Cabinets of Mr. Dale, Mr. Shuckard, and the Author.

THAT the neuration of the wings is often a valuable and useful character to assist in the formation of genera cannot be denied, but it is equally true that a strict adherence to it without an

1/2 avant de famille G. 889, 3 up. 1/2. Dec. 1851

examination of the trophi, will frequently lead to error. The group before us was many years since noticed by Mr. Kirby and called *Rhopalum*, and other celebrated writers have considered it a distinct type from *Crabro*, with which Mr. Shuckard has united it in his elegant Monograph of the Fossorial Hymenoptera. On a comparison of the trophi however the necessity of separating our two insects from *Crabro* is manifest: the most obvious differences are the palpi being only 5 and 3-jointed, whilst in *Crabro patellatus* the maxillary have 6 and the labial 4 joints, and the lip is nearly as long as the labial palpi: I ought to remark that I could not obtain recent specimens for dissection, but I have no reason to think they had been mutilated. Even the two species of *Rhopalum* vary so materially that they must form at least 2 sections; the antennæ of the males and the clypeus are very different, as well as the structure of the tarsi, and the remarkable lobes attached to the abdomen I have not yet discovered in *R. rufiventre*.

1. tibiale *Fab.*—*Curt. Brit. Ent. pl.* 656. ♂.—*CORYNORUS St. Farg.*

Male black, shining, slightly silky; clypeus porrected obliquely, silvery, lobed in the centre; inner margin of eyes silvery; trophi ochreous, base of mandibles black; basal joint of antennæ yellow beneath, 2nd subtrigonate produced on the inside, yellow at the apex, 3rd small truncated obliquely, 4th and 5th stout, elongated and somewhat hatchet-shaped, being emarginated beneath, following short, 6th and 7th yellow at the apex, 9th and 11th straw colour (1*): abdomen with the margin of the 2nd segment sometimes ferruginous, as well as the apex, which is furnished with 2 lanceolate laminæ: nervures and stigma piceous: legs yellow; thighs black, except at the tips, anterior tibiæ with a black spot on the outside, the others with a black ring, the hinder dilated and rufous at the apex: tarsi tipped with orange, basal joint ciliated externally and dilated in the anterior, hinder brown, the base and 4th joint subrufous, the former produced externally at the apex. *Female* larger and stouter; clypeus acuminate in the centre; antennæ simple, 4th joint longer than the 3rd or 5th; basal joint of tarsi not dilated, 4 anterior tibiæ piceous beneath: anus acuminate and channelled above.

July, Parley, Blandford, and Gl. Wootton, Mr. Dale; Darent, Mr. Shuckard; on Lime-trees, Southgate, Mr. F. Walker; about laurels at Netley, Shropshire, Mr. Westwood.

2. rufiventre *Fab.*—*Panz.* 72. 12.—*PHYSOSCELUS St. Farg.*

Shining black; margins of the 2nd abdominal segment and sides of the 3rd ferruginous; clypeus semicircular and silvery, sides of face silvery; mandibles yellow, tips ferruginous; antennæ with the basal joint yellow beneath, the following ochreous beneath excepting the apical ones; legs straw colour, thighs black, except at the apex, intermediate tibiæ with a dark dot on the inside at the middle, hinder legs piceous, base of tibiæ whitish: $2\frac{1}{4}$ lines. *Female* with the abdomen rufous, excepting the petiole, and sometimes the 2nd, 4th and 5th segments are piceous: $2\frac{3}{4}$ lines.

July, Parley, in a garden at Blandford, Gl. Wootton, Mr. Dale; near Ryde, Rev. G. T. Rudd; in June, Norfolk, and August, Isle of Arran, J. C.

The Plant is *Caucalis* (*Torilis Adan.*) *infesta*, Spreading Hedge Parsley.



DIODONTUS GRACILIS.

ORDER Hymenoptera.

FAM. Crabronidæ.

*Type of the Genus, Psen pallipes Panz.*DIODONTUS Curt.—Stigmus Lat.—Pemphredon Fab., Vand. L.—
Psen Panz.—Crabro Fab.

Antennæ inserted below the middle of the face, a little longer than the head, velvety, filiform, and 13-jointed in the male; 12-jointed in the female (1), basal joint the longest and stoutest, subpyriform and truncated obliquely, 2nd obovate, 3rd rather more slender and oblong, the remainder a little stouter, of equal length and oblong, terminal joint longer and ovate at the apex.

Labrum semiorbicular, notched in front, forming two obtuse points, slightly produced, the margin producing a few bristles (2).

Mandibles alike, long, narrow, obtuse, pilose, truncated obliquely and notched, forming two rounded and concave teeth, the lower one with a series of bristles on the inside (3).

Maxillæ terminated by an oblique subovate lobe, very pilose at the apex, with a porrected one on the inside, producing a few bristles. *Palpi* long, hairy and 6-jointed, basal joint the shortest and slenderest, 2nd and 3rd very broad, the remainder slender and attenuated to the apex, 4th the longest, 5th and 6th not longer than the 2nd and 3rd (4).

Mentum oblong, a little dilated before. *Labium* very short and fleshy. *Palpi* rather long, pointed and pilose, basal joint long, naked and clavate, 3 following much shorter, nearly of equal length, the 3rd a little the shortest, 4th a little narrower and ovate at the apex (5).

Head broad, face orbicular, concave: eyes lateral and ovate: ocelli 3 in triangle on the crown of the head. Thorax obovate. Abdomen elongate conic or ovate; petiole very short. Wings with 3 submarginal cells, the 1st long, the 2nd small, oblong or rhomboidal and 3 discoidal cells. Legs, anterior the shortest: thighs slightly incrossed: tibiæ short, slender at the base, anterior with a broad spine at the apex, the others with 2 slender ones, the posterior generally spiny outside in the females: tarsi long, especially the posterior, 5-jointed, basal joint very long, the others short and decreasing in size to the apex, the terminal joint being clavate: claws small (8, a fore leg).

GRACILIS Curt. Guide, Gen. 685^a. 1.

Male black, slender; head and thorax very thickly and minutely punctured, the former with the lower part of the face clothed with silvery hairs; palpi and a stripe outside the mandibles ochreous-white; metathorax coarsely reticulated, shining: abdomen very glossy, minutely but not thickly punctured, segments coarctate especially at the base, the apex ferruginous with a recurved spine: wings quite transparent, nervures and stigma piceous, 2nd submarginal cell oblong, very little narrowed above: tips of thighs, base and tips of tibiæ and tarsi ochreous, excepting the hinder pair and the apex of the others.

In the Cabinets of Mr. Shuckard and the Author.

THE additional discoidal cell will distinguish *Diodontus* from *Stigmus*; and the more narrowed central submarginal one, as well as the short petiole, at once separate it from *Pemphredon*. I should not, however, have detached it from the latter genus if the trophi had been at all similar; but *Pemphredon* has an undivided *labrum*, the *mandibles* are trifid, and the *palpi* differently formed to those of *Diodontus*.

One British species only has been recorded, to which I have the pleasure of adding three others.

1. *D. gracilis* Curt. Brit. Ent. pl. 496. ♂.

I took two males at Glanville's Wootton the middle of June, and should have given them as that sex of the following species if the insect supposed by Vander Linden and his friend M. Westmael to be the male, did not so materially differ from my specimens.

1^a. *D. insignis* Vand. L.—Curt.

Female 2½ lines; black, basal joint of antennæ beneath, a broad stripe outside the mandibles and a spot on each side below the wings, whitish ochre; metathorax not strongly reticulated, striated at the base and on a cordate space: wings slightly tinged with brown: legs similar to *D. gracilis*; but the anterior tibiæ are entirely ochreous, and the posterior are not bristly outside.

2. *D. minutus* Fab. Ent. Syst. 2. 302. 32.

Male 2 lines; black, minutely punctured, lower part of face silvery; palpi, underside of antennæ (except at the base) and mandibles, pale yellowish, excepting the tips which are ferruginous; scapulars and a spot below them yellowish white, the former with a brown spot; metathorax strongly reticulated, striated at the base; tips of thighs ochreous, tibiæ and tarsi of the same colour, the posterior tibiæ brownish at the middle and the tips of the tarsi rather dark: wings transparent. *Female* 2½ lines; black, mandibles as in the male, palpi brown; thorax the same; abdomen stouter, ovate-conic, clothed with very short ochreous pubescence; tibiæ, tarsi and tips of thighs ferruginous-ochre with a piceous space on all the tibiæ at the middle, the posterior having a few short spiny bristles outside: wings stained pale brown, the 2nd submarginal cell trapezate.

The 1st submarginal cell is shorter in this species than in *D. insignis*, and the 2nd recurrent nervure is not united at the middle of the posterior discoidal one, but beyond it.—July 30th, Black Gang Chine, Isle of Wight.

3. *D. pallipes* Panz. 52. 22.—*tristis* Vand. L. p. 76. 1.

Female 2 to 2½ lines, black, shining, minutely and sparingly punctured, tips of mandibles castaneous, palpi brownish: metathorax strongly reticulated; wings with a brownish cloud across the middle, the 2nd submarginal cell very much narrowed above; tarsi brown, palest at the base, anterior tibiæ sometimes of the same colour inside towards the apex.

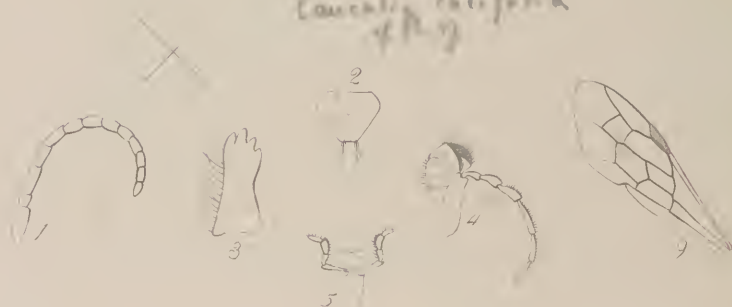
Pallipes is not a well chosen name for this insect: nevertheless it ought to be retained.

My specimens are, I believe, from Norfolk. The male I have never seen.

The Plant is *Hypericum pulchrum* (Upright St. John's Wort).



Caucasica *Verbena*
4 R. 7



Cemonus / PEMPHREDON UNICOLOR.

ORDER Hymenoptera. FAM. Crabronidæ.

Type of the Genus, *Pemphredon lugubris* Fab.

PEMPHREDON Lat., Fab., Vand. L., Curt.—Cemonus Jur.—Crabro and Pelopœus Fab.—Vespa Linn.

Antennæ inserted in front of the face, approximating, not so long as the head and thorax, 13-jointed in the males (1), basal joint long and stout, 2nd subglobose, 3rd nearly as long as the 1st, the following decreasing in length and slightly tapering, apical joint ovate-conic, more curved 12-jointed in the female.

Labrum inserted under the clypeus, horny, trigonate, all the angles truncated, the anterior margin narrow and producing a few long bristles (2).

Mandibles crossing, elongated, broadest at the base, a little narrowed at the middle, the apex rounded and quadridentate in the female (3); forming 3 strong teeth in the male of *P. unicolor*.

Maxillæ small, terminated by 2 lobes, the inner one small ovate and ciliated internally, the outer one large subrhomboidal and externally pubescent. *Palpi* long, pubescent on the inside, 5-jointed, basal joint the shortest clavate, 2 following nearly of equal length, the stoutest, semilunate, 4th the longest, 2 following a little shorter, 5th a little the slenderest (4).

Mentum elongate-ovate, anterior margin bisinuated to receive the *Palpi*, which are rather long, slender, internally pubescent and 4-jointed, basal joint long and clavate, the remainder short, 2nd and 3rd the stoutest, semilunate, 4th elliptical. *Labium* transverse, cordate (5).

Head slightly transverse, a little broader than the thorax, subquadrate, the angles rounded; clypeus emarginate in the male, convex in the female: eyes remote, ovate, placed obliquely at the anterior angles: ocelli 3 in triangle on the crown. Thorax ovate: scutell transverse, semiovalate: metathorax gibbose. Abdomen not larger than the thorax, slightly depressed, ovate-conic and attached by an elongated strong petiole, slightly arched and narrowed at the base. Wings, superior with 3 submarginal cells, 1st long, 2nd subquadrate, each receiving a recurrent nervure (9), or the 1st receiving two, the 2nd none. Legs rather short, anterior a little the smallest: tibiæ short clavate, spurred at the apex: tarsi a little longer than the tibiæ, slender and 5-jointed, basal joint elongated, 4th the smallest: claws curved and acute.

UNICOLOR Fab., Lat.—Curt. Guide, Gen. 686. 4.—*Sphex ater* Fab.

In the Author's and other Cabinets.

It would not be easy to find two groups so nearly allied, that differ more essentially in the structure of their trophi, than *Pemphredon* and the species I have separated at folio 496 under the name of *Diodontus*, from the bidentate *labrum* of the type, which, it must be remembered, is the *P. tristis* of Vander Linden, and is presumed to be synonymous with Panzer's *Psen pallipes*. *D. minutus* is also a typical species, but for want of specimens for dissection I could not at the

1/2 de June 1846, Berlin 1846

Parasite of *Aphis* *diversa*, etc. *Hymenoptera* *Acridæ*

time ascertain whether *D. gracilis* and *insignis* had bidentate labrums.

I am happy in being able to introduce some interesting remarks connected with the œconomy of these insects which are new to me. Towards the end of August, during the late meeting at Bristol, Mr. Hewitson gave me some straws taken from the thatch of a summer-house, each of them containing from 10 to 20 Hymenoptera; a few days after, Mr. Waring took me to the summer-house in his garden, when I saw multitudes of small black Hymenoptera entering the straws of the thatch, many of them carrying an Aphis. I secured some for subsequent examination, when I was greatly surprised to find what I had supposed, whilst they were flying, to be merely the sexes of one species, comprised, I believe, four genera, viz. *Hylæus annularis* (folio 373), males of *Psen ater* (fol. 25), *Pemphredon unicolor*, and a *Diodontus*. On splitting the straws I found numbers of perfect insects, together with larvæ inclosed apparently in pollen, masses of an Aphis, and occasionally a specimen of *Hedychrum imperiale* (fol. 38). I had no opportunity of revisiting the spot after I found there were several genera whose habits were so similar; I therefore have some doubt whether I did not take the *Hylæus* and *Diodontus* out of the straws. I am pretty certain it was the *Pemphredons* that were carrying the Aphides, which I believe were taken from a rose-bush. The *Hedychrum* was in all probability a parasite of the *Hylæus*. The British *Pemphredons* may be thus divided.

* 1st and 2nd submarginal cells, each receiving a recurrent nervure.

1. *Lugubris* Fab.—*Lat.*—*unicolor* Jur. *Gen.* 28. *pl.* 11 ♀. Black, shining, clothed with white pubescence, thickly punctured, except the abdomen and legs: antennæ thickened a little at the middle in the males, with the clypeus silvery: ♂ 4, ♀ 5 lines long.

Beginning of June, old paling and trunks of dead trees.

2. *morio* Vand. *Lind. part* 2. *p.* 82. *n.* 5. “Black, clothed with griseous pubescence, the abdominal petiole short: 3 lines long.”

** 1st marginal cell receiving 2 recurrent nervures, the 2nd none.

3. *unicolor* Fab.—*Curt. Brit. Ent. pl.* 632. ♂. As this is not the *S. unicolor* of Panz., the Fabrician name of *ater* ought not to have been superseded. Shining black with whitish pubescence, head thickly punctured, clypeus silvery in the male, thorax sparingly punctured before, metathorax with a shining elevated semicircular line, petiole punctured and channelled: wings tinged with brown, especially the apex of the anterior.

May and June, Oaks, Coomb-wood and Lowestoft; 28th July, Castle Connel; 8th July, under the Cliff, Dover; end of August, about the thatch of a summer-house, Bristol.

For specimens of the rare plant *Caucalis latifolia*, Broad-leaved Hen's-foot, I am indebted to Miss Queckit, who gathered them in a corn-field near Langport.



580.

MELLINUS SABULOSUS.

ORDER Hymenoptera.

FAM. Crabronidæ.

Sphagnum *Mellinus*Type of the Genus, *Vespa arvensis* Linn.*does not deposit
its eggs in the soil*

MELLINUS Fab., Lat., Jur., V. Lind., Curt.—Crabro Fab., Panz.

Antennæ longer than the head, slender and inserted at the middle of the face, a little remote, subfusiform, pubescent and 13-jointed in the male, basal joint short but the stoutest, ovate-truncate, 2nd minute subglobose, 3rd and 4th nearly of equal length and not longer than the 1st, the remainder insensibly decreasing in length, 5th to the 8th oblong, the remainder concave beneath, forming a protuberance at the base, the apical joint longer, attenuated and rounded at the apex (1 ♂); longer filiform and 12-jointed in the female, with all the joints more elongated and simple, 3rd joint rather the longest (1 ♀).

Labrum broad and short, inserted under the clypeus, anterior margin nearly straight and ciliated with long hairs (2).

Mandibles long, crossing, hairy and bifid in the male, tridentate in the female (3), the apex being lanceolate, with 2 rounded teeth beneath.

Maxillæ terminated by a large ovate, concave, pubescent lobe, with a smaller one lying close behind it. *Palpi* long pubescent and 6-jointed, basal joint the shortest, 2nd a little longer and stouter, both clavate, 3rd rather stout and considerably longer, 4th the longest, 5th the length of the 3rd joint, 6th a little longer and very slender (4).

Mentum oblong, rounded before, nearly concealing the *Lip*, which is broader, the angles rounded. *Palpi* rather long, pubescent and 4-jointed, basal joint long and clavate, the remainder shorter, nearly equal in length, 2nd thickest at the apex and truncated obliquely, 3rd and 4th a little curved (5).

Males considerably smaller than the females. Head large and orbicular: eyes lateral and ovate: ocelli 3, in triangle on the crown of the head. Thorax obovate; metathorax foveated. Abdomen ovate, with a pear-shaped peduncle. Wings with 1 marginal, 4 submarginal and 3 discoidal cells. Legs alike in both sexes: thighs incrassated, small at the apex: tibiæ, anterior with a curved spine at the apex: tarsi long, 5-jointed, basal joint very long in the anterior, notched at the base, 2 following turbinate, 4th bilobed, 5th thick and short: claws rather long curved and acute: pulvilli large, forming a large sucker at the apex (8, a fore leg).

SABULOSUS Fab.—Curt. Guide, Gen. 687. 1.

THE Mellini are partial to dry sandy banks, where the females form burrows to deposit their eggs; and when they hatch, the parent carries the young larvæ dead flies to feed upon. I have twice watched the *M. arvensis* thus employed, and the following observations are copied from my note-book.

Sept. 16th. I was exceedingly amused at the strength and sagacity exhibited by a species of Mellinus. It had captured a large blue fly, probably *Musca vomitoria*, which it held tight by the rostrum with its mandibles, the under side of the abdo-

of a female (No. 571, Sep. 16th, 1845, from the same place as the male)
Re. and Eggs

men lying parallel to its own; in this way it flew about a northern bank, alighting occasionally upon the grass that covered it, when at last it found its retreat, at the mouth of which it stopped, and entering it backward, drew in the victim in spite of its struggling, with the greatest facility.

The following species are recorded as British.

1. *sabulosus* *Fab.* ♀.—*ruficornis* *Panz.* 77. 17. ♀.—*petiolatus* *Panz.* 46. 12. ♀ *var.*

Expanse 9 lines. Black, antennæ and legs ferruginous, 2 basal joints of the former black above; base of thighs, excepting hinder pair, black; internal margin of eyes and 4 dots on the clypeus ferruginous; an interrupted line on the collar, a spot on the scutel, one under each wing, 4 on the body and a band near the apex, yellow.

I took a female of this, and a male of the following, several years since in Suffolk; and Capt. Blomer met with it, I believe, in the Isle of Man.

2. *fulvicornis* *Fab.*—*Curt. B. E.* 580. ♂—*Panz.* 98. 18. ♂.—*frontalis* *Panz.* 46. 11. ♂? I consider these to be the males of the foregoing species, for the specimen I have figured agrees with Fabricius's description, although Panzer's plate does not, but this figure is evidently inaccurate, the antennæ having 18 joints.

Black, shining, minutely and thickly punctured, hoary-pubescent; antennæ and legs ferruginous, basal joint of the former black above, yellow beneath, 2nd black, a few of the following dusky above, thighs black at the base, inner margin of eyes and clypeus, a spot at the base of the mandibles, an interrupted line on the collar, a spot on the scutel, one beneath each wing, 2 on the 3rd segment of the abdomen and a band at the base of the 6th, yellow; tips of the 4 anterior thighs beneath of the same colour, and there is a minute spot on each side the 2nd joint.

3. *arvensis* *Linn.*—*clavata* *DeG.*—*U-flavum* *Panz.* 17. 20. ♀.—*bipunctatus* *Fab. var.*

Male $6\frac{1}{2}$ to 9 lines expanse. Black, antennæ rufous beneath, basal joint yellow; palpi, margins of eyes and clypeus and outside of mandibles yellow; a line on the collar, a spot on the scutel, 2 beneath each wing, a spot on each side the 2nd and 4th abdominal segments, a band on the 3rd and a narrow one on the 6th, yellow: legs ferruginous, yellow inside, base of thighs and a stripe on the inside of the 4 anterior tibiæ black. *Obs.* sometimes the coxæ and 3rd segment of the abdomen are spotted with yellow beneath, and the 2 yellow basal spots above are wanting. *Female* 12 lines: similar to the male, excepting the abdomen; on the nodule of the peduncle are 3 yellow dots, the 2nd, 3rd, and 5th segments are yellow, edges of the 2 former black, and there is a large yellow spot on each side the 4th. *Obs.* sometimes there are only 2 dots on the peduncle or none, and occasionally the 3 spots on the 4th segment form a band; in others the face, except the inner margin of the eyes, and the antennæ, except the basal joint, are black.

The females are common on all sandy banks in August and September, and the males on the Fern.

4. *pratensis* *Jurine, pl.* 10. *G.* 19. ♀.

Length 7 lines. Black, inner margin of eyes and clypeus, basal joint of antennæ, base of mandibles, a line on the collar, a spot on the scutel, 2nd and 3rd segments of abdomen, and a band at the base of the 5th? yellow, coxæ trochanters and base of anterior thighs black.

I have never seen a British specimen.

The Plant is *Selinum palustre* (Marsh Milk-weed).



Hygroplitis



ALYSON KENNEDII.

ORDER Hymenoptera. FAM. Crabronidæ.

Type of the Genus, Alyson bimaculatus Panz.

ALYSON Jur., Panz., Lat., V. Lind., Curt.—Pompilus Fab.

Antennæ remote at their insertion, which is a little below the middle of the face, at the base of the clypeus, longer than the head, filiform and 13-jointed in the male, basal joint longer, short and stout, 2nd subglobose, 3rd scarcely longer, 4th oblong, the remainder nearly of equal length, apical joint subconic (1 ♂); more curved, slender, a little clavate and 12-jointed in the female, basal joint long and stout, 2nd obovate, nearly as long as the 1st, the latter shorter, the remainder subtrubinate, gradually increasing in diameter and decreasing in length, apical joint elongate ovate (1 ♀).

Labrum inserted under the clypeus, transverse, pocket-shaped, anterior margin bisinuated, forming 3 lobes, sparingly ciliated with spines (2).

Mandibles crossing, long and narrow, curved and concave, bidentate at the apex and ciliated with bristles on both margins (3).

Maxillæ ovate, terminated by 2 incurved lobes, the inner one ovate and transparent, the outer one larger concave horny and hairy outside. *Palpi* long, pubescent and 6-jointed, basal joint small, chalice-shaped, 2 following elongated, of equal length, slightly clavate, 4th the longest, 5th nearly as long, both linear, 6th as long as the 3rd elongate-ovate (4).

Mentum oblong, rounded at the base, deeply emarginate on each side, before forming a lobe in the centre to receive the *Palpi* which are long, rough with hairs and 4-jointed, basal joint a little the longest and clavate, 2nd short obtrigonal, 3rd and 4th nearly as long as the 1st, the former subelliptic, the latter drooping and elongate-ovate (5).

Males much smaller than the females. Head short and broad; face orbicular; clypeus tridentate: eyes entire and ovate: ocelli 3 in triangle. Thorax oblong; collar narrow and rather elongated in the female, in which sex the postscutellum has the angles acuminate; with an elongate-trigonal space on the back, furrowed obliquely on each side. Abdomen elongate-ovate, attenuated in the male and bispinose at the apex. Wings with 1 marginal, 3 complete submarginal (the 2nd petiolated) and 3 discoidal cells (9). Legs not long but slender: thighs, posterior with a strong sharp tooth beneath at the apex (8†): tibiae short, especially the anterior, and spurred at the apex: tarsi very slender, long and 5-jointed, basal joint long, the 3 following obtrigonal in the anterior with the terminal joint stout and ovate, 4th not much shorter than the 5th, in the others: claws and pulvilli distinct.

KENNEDII Curt. Guide, Gen. 688. 1.

In the Author's Cabinet.

THE œconomy of this genus is, I believe, unknown; the males bear a little resemblance, I think, to the Mutillidæ, and the fe-

* *Notes on the genus* (p. 576), *by* *Robert Macdonald* 5/2/8

males have the habit of the *Pompili*, but the neuration of the wings is like that of *Nysson*: there is, however, a combination of characters which renders this a strongly marked genus; the narrow collar, the striated postscutel more or less spined, and bearing an escutcheon-shaped impression, and the large apical joint of the anterior tarsi characterize the females, whilst the males are distinguished by two small remote spines at the apex of the abdomen, and both sexes have a strong tooth at the apex of the posterior thighs, which, although distinct enough, is not readily seen except in profile.

The only British specimen I have seen of this genus is the one figured, but I have heard of Mr. Kirby having another, and on the authority of the "Systematic Catalogue," the sexes of *A. bimaculata* were recorded in the Guide. As I have German specimens, I shall add the characters of the latter that it may be the more readily identified.

1. *A. Kennedii* Curt. *Brit. Ent. pl.* 584.

Female black, very thickly and finely punctured, and clothed with very short ochreous pubescence; anterior margin of the clypeus and trophi ochreous and ferruginous, tips of mandibles piceous; antennæ dark fuscous, underside of basal joint ferruginous, postscutellum bearing an elongated escutcheon, the sides obliquely furrowed; two basal segments of abdomen and a small portion of the base of the 3rd rufous, with the edge of the 2nd silky white on the sides; wings iridescent, yellowish, nervures and marginal cell brown, as well as 2 spots beneath, forming an interrupted fascia: legs pitchy, anterior tarsi tibiæ and tips of thighs ferruginous, the tarsi and apex of hinder tibiæ brown.

I have the gratification of naming this unique insect after my friend Benjamin Kennedy, Esq., of Clapton, who was with me when I beat it out of an Oak growing in a hedge near Hastings, in August 1823.

2. *A. bimaculatus* Panz. 51. 4. ♀.—*Pompilus spinosus* Panz. 80. 17. var.?—*Sphex fuscatus* Panz. 51. 3. ♂.

Male black, shining, face below the antennæ silvery with pubescence; clypeus, a portion of the inner margin of the eyes, underside of basal joint of antennæ, a line before the wings, 2 spots on the scutellum, and one on each side the 2nd segment of abdomen cream-colour, apex ferruginous; legs ferruginous, darker outside, coxæ and trochanters black, the latter spotted with white, anterior tibiæ inside and the posterior at the base whitish; nervures and stigma brown, with a faint transverse cloud: expanse $4\frac{1}{2}$ lines. *Female* larger, $6\frac{1}{2}$ lines in expanse; the face, thorax, legs, &c. are similarly coloured, but the 1st and basal half of the 2nd segment of abdomen are rufous, the latter having the 2 cream-coloured spots; the apex is black and the cloud on the wings distinct.

The Plant is *Sagina procumbens* (Chickweed Breakstone).



Cladium mariscus

(GORYTES) BICINCTUS.

ORDER Hymenoptera.

FAM. Crabronidæ.

Type of the Genus, *Sphex mystacea* Linn.

GORYTES Lat., Spin., Van Lin., St. Farg., Curt.—Mellinus Fab., Panz.—Arpactus Jur., Panz.—Sphex & Vespa Linn.

Antennæ inserted at the middle of the face, approximating, long, filiform, nearly straight and 13-jointed in the male (1 ♂), the basal joint subovate-truncate, 2nd cup-shaped, remainder long, of equal length, each joint slightly curved, the apical joint a little conical at the apex: not longer than the head and thorax in the female, curved, clavate and 12-jointed (1 ♀), basal joint rather the stoutest, subovate, 2nd small cup-shaped, 3rd and 4th long and slender, the remainder decreasing in length and increasing in diameter, apical joint elongate-ovate and a little curved. *Labrum* transverse, very short, a little curved and ciliated with bristles, some very long (2).

Mandibles crossed in repose, long, narrow, a little curved, with a few hairs outside, terminated by a strong tooth with a smaller one beneath it (3).

Maxillæ with the basal portion large and nearly semiorbicular, terminated by two rounded hairy lobes. *Palpi* long, pubescent, and 6-jointed, basal joint the shortest, 4th and 6th the longest, 2nd and 3rd the stoutest, somewhat obovate, especially the latter, 4th and 5th clavate, 6th slender, conical at the apex (4). *Mentum* subquadrate, the basal angles dilated, with a rounded lobe in front which conceals the *Lip*. *Palpi* not short, very pubescent and 4-jointed, basal joint a little the longest and clavate, the remainder nearly of equal length and obovate, terminal joint the slenderest and somewhat elliptical (5).

Males smaller than the females. Head transverse, face orbicular: eyes elongate-ovate, narrowed above: ocelli 3 in triangle. Thorax globose: scutellum transverse-ovate. Abdomen ovate conical. Wings with one marginal and 4 sub-marginal cells, the 2nd receiving 2 recurrent nervures. Legs rather short and stout in the female: thighs short: tibiæ clavate, anterior with one, the others with 2 spines at the apex: tarsi 5-jointed, posterior the longest, anterior sometimes a little dilated and ciliated in the females, basal joint the longest, 4th the shortest: claws and pulvilli large in the female.

BICINCTUS Rossi.—Curt. Guide, Gen. 690. n. 8.

Black; 2 basal joints of antennæ yellow and the others ochreous beneath; trophi and lower part of face yellow, apex of mandibles brown: collar, a dot on each side, and 2 spots on the scutellum, yellow; a triangular space on the postscutellum finely striated; basal joint of abdomen pear-shaped, with a yellow fascia divided in the middle, 2nd segment with a broad, 3rd with a narrow yellow band, the former not touching the posterior margin: wings slightly fuscous, the marginal, central submarginal, and the discoidal cell below them, clouded with brown: legs ochreous, 4 anterior coxæ, and 1st pair of trochanters with yellow spots beneath; thighs yellow beneath; tibiæ with a black streak outside; tarsi ferruginous, brown towards the apex; posterior legs black, tibiæ with a streak of yellow outside at the base.

Antennæ 13-jointed in male, 12-jointed in female. *Palpi* 6-jointed in male, 4-jointed in female.

So much confusion has been created by the misapplication of synonyms that I shall not attempt to unravel them, which is the less necessary as Mr. Shuckard will fully investigate them in his Monograph on the Fossorial Insects. In the meanwhile the reader may consult Vander Linden's *Observ. sur les Hymen. d'Europe* and an excellent paper of Le Pelt. St. Fargeau's in the 1st vol. of the *Ann. de la Soc. Ent. de France*.

Gorytes is distinguished by the 2nd submarginal cell receiving 2 recurrent nervures, and the following divisionous form as many genera in the Count's paper.

GORYTES. Anterior tarsi simple in both sexes.

1. mystaceus *Linn.*—*Panz.* 53. 11 ♀.—*campestris Linn. var.*
—the *V. flavicincta Don.* 13. 468. 1. is evidently an *Ichneumon*!

I have found both sexes on young oaks the beginning of June in Coomb-wood; it is abundant at Hampstead and Highgate and at Glanville's Wootton, Mr. Dale.

2. quadrifasciatus *Fab.*—*Panz.* 98. 17 ♂.

Highgate, Mr. Shuckard, to whom I am indebted for specimens.

3. arenarius *Panz.* 53. 12. I have never seen a British specimen.

EUSPONGUS *Le Pel.* Anterior tarsi ciliated in the female.

4. Libitarius *Curt.*

I took a male on flowers in a marsh at Horning, Norfolk, 24th of June; it is found also at Battersea, Hampstead and Highgate.

5. quinquefasciatus *Panz.* 53. 13 ♀. I know this only by the figure.

6. laticinctus *Le Pel.*

I have a female from the collection of the late Mr. Lee, and another has been taken in the New Forest.

HOPLISUS *Le Pel.* Antennæ obtuse in both sexes.

7. quinquecinctus *Panz.* 72. 14.—*ruficornis Lat.*

I have never seen a British specimen.

LESTIPHORUS *Le Pel.* 10th joint of antennæ concave above in the male, filiform in the female: basal joint of abdomen forming a pear-shaped petiole.

8. bicinctus *Rossi.*—*Curt. Brit. Ent. pl.* 524 ♂.

The specimen figured stood for many years in my collection as an unique Insect, but Mr. Shuckard has lately met with a female taken in the New Forest by Messrs. Harding and Bond.

The Plant is *Schænus* (*Cladium* *Schrad.*) *mariscus*^{*} (Prickly Bog-rush).

* *Gilbert & Lapeyrie - Nouvelle Flore française* p. 1124



July 24 I wrote London June 1 1874

For more information

ORDER Hymenoptera. FAM. Larradæ *Lat., Leach.*

Type of the Genus Trypoxylon atratum Fab.

PSEN *Lat., Jur., Panz.* Trypoxylon, Pelopæus *Fab.*

Antennae inserted near the centre of the face, clavate, curved, smooth, 12-jointed in the female, 13-jointed in the male; first joint large, second small, terminal joint ovate. (1.)

Labrum exerted, transverse, subrotundate before, entire, ciliated. (2.)

Mandibles slender, scarcely arcuated, unidentate internally. (3.) *Maxillæ* coriaceous, divided transversely, terminal process nearly membranaceous, rounded and ciliated; *Palpi* elongated, unequal, 6-jointed; first joint very small, third largest, sixth slender. (4.)

Mentum large, dilated in the centre, hairy (5. a.), (the point to which the maxilla is attached is shown at e.): *Palpi* long, 4-jointed, first joint long, second and third short, last robust, ovate. (b.)

Lip short, with the edges conniving internally. (c.)

Clypeus subrotundate, anterior margin elevated. Head transverse, as broad as thorax, with a tubercle between the antennæ. Eyes oval, entire, remote. Ocelli 3, inserted on crown of head in a triangle. Thorax short, nearly ovate. Scutellum narrow, small. Abdomen ovate-conic, with an elongated, abrupt peduncle. Superior wings with one marginal cell, not extending to the apex, and three perfect submarginal cells, the middle one nearly trigonate, either receiving one or two recurrent nerves. Inferior wings with two complete basal cells. Legs rather small. Tibiæ spined. Tarsi 5-jointed, first joint nearly as long as the three following, last terminated by simple claws and pulvilli. (8. a fore leg.)

EQUESTRIS *Fab. Syst. Piezatorum*, p. 182. n. 6.

Black: clypeus and face silvery with hair, shining; first segment of abdomen rufous, with a black spot at its base; second entirely, and third partly, rufous. Wings hyaline, iridescent. Antennæ rufous beneath. Thighs and coxæ black. Tibiæ and tarsi pale ferruginous, the former annulated with black.

In the Cabinets of Mr. Haworth and the Author.

THIS pretty little species I took flying near Lyndhurst in the New Forest the end of August 1822. Mr. Haworth has also taken it in the neighbourhood of London. My specimens per-

4/20/12 to 9/20/12. Bert and I 137 Hama coll.

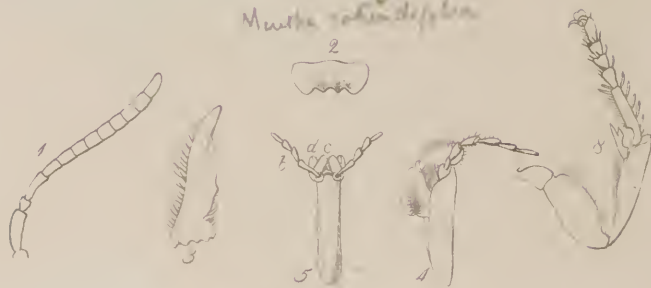
fectly accord with each other; but it must be exceedingly variable if Jurine be correct in considering *Trypoxylon equestre* Fab., *Psen rufa* Panz., and his own *P. bicolor*, the same species. *P. ater* is another species found in the vicinity of London upon posts and in sandy places in June and July; and Mr. Stephens has two others unnamed, which he considers distinct.

Jurine has made two divisions in this Genus: the first contains *P. ater*, with the second submarginal cell receiving the first recurrent nerve only; the second contains *P. equestris*, in which the second submarginal cell receives the two recurrent nerves. Not having had an opportunity of examining a male of this Genus, the number of joints in the antennæ of that sex is given upon the authority of Jurine. The three lobes mentioned by Latreille in his observations upon the *Larradæ*, I could not discover in the lip of the species that I dissected; and he does not mention that organ in his generic description. The females from which the characters and figures are taken are armed with sharp stings, that are not entirely concealed.

The plant figured is *Ranunculus Ficaria* (Common Pilewort).



Mentha sylvestris



Engelm. Bot. Calif. 1844

CERCERIS LÆTA.

ORDER Hymenoptera. FAM. Crabronidæ *Lat., Leach.**Type of the Genus, Cerceris læta Fab.*CERCERIS *Lat., Leach., Sam.*—*Philanthus Fab., Jur., Panz.*

Antennæ inserted near the middle of the face, approximating, thickened towards the extremity, 13-jointed in the males, 12-jointed in the females, basal-joint the longest robust, 2nd globose, 3rd slender, longer than the following, which gradually become more robust, terminal joint ovate at the apex (1).

Labrum entirely concealed, naked, transverse, with 2 lateral lobes and a central one elevated and emarginate (2).

Mandibles remote, crossing, very long, curved, dilated and sinuated on the inside, deeply notched and pilose near the base (3).

Maxillæ with the stalk long and horny, terminated by a large lobe, coriaceous and pilose at the margin, also a large horny lobe on the inside with a larger membranous appendage. *Palpi* 6-jointed, basal joint small, the remainder of equal length, 2nd and 3rd truncated obliquely, 4th and 5th subclavate, 6th the slenderest (4).

Mentum long, horny, linear, the anterior angles hollowed to receive the *Palpi*, which are 4-jointed, basal joint long, the remainder shorter of equal length, the 2nd and 3rd a little dilated.

Lip rather short, membranous pubescent, the central lobe cleft (5c), the lateral ones the narrowest (d).

Head transverse, subquadrate; face flat. *Nasus* small semicircular entire. *Eyes* elongate ovate. *Ocelli* 3 in triangle. *Thorax* oval, narrower than the head. *Abdomen* elliptic, strangulated at the union of the articulations, 7-jointed in the males, 6-jointed in the females, the 1st segment nodiform, terminal joint narrowed, flat and truncated. *Superior wings* with 1 marginal and 4 submarginal cells, the 2nd being petiolated. *Legs* robust. *Tibiæ* clavate, anterior producing a long spine at the apex, dilated internally; posterior serrated and spurred. *Tarsi* 5-jointed, basal joint the longest, anterior producing strong spiny appendages on the outside. *Claws* simple. *Pulvilli* distinct (8, a fore leg).

LÆTA *Fab. Ent. Syst. v. 2. p. 291. n. 10.*

Female. Black, strongly punctured and pubescent. *Antennæ* ferruginous beneath towards the base, excepting the 1st joint. Three yellow spots on the face, 2 on the collar, one on each scapula, the base of the post-scutellum and a spot on each side of the same colour. *Abdomen* banded with yellow, forming a lunular spot on each side the 1st joint, a large emarginate band on the 2nd; slender bands on the 3rd and 4th, and a deep oval one on the 5th. *Wings* slightly fuscous, the margins darker. *Legs* bright fulvous, coxæ and base of thighs piceous, except in the hinder pair which are dentated beneath and piceous at the apex.

*In the Author's and other Cabinets.**11 near a gentle cobweb, in the middle of the abdomen.*

THE Cercerides are well characterized by the singular form of their abdomens, the segments being coarctate, or girted in at their margins, and the petiolated submarginal cell of the superior wings will also distinguish them from neighbouring genera*.

They are generally found in sandy and heathy situations; and the males, which have an additional joint to their antennæ as well as to their abdomens, are much rarer than the females, from which they also frequently vary in their markings. They nourish their larvæ (Latreille informs us) with the dead bodies of the Andrenæ (a genus of bees, plate 129), which they place at the bottom of their nests in the manner of the Sphecidæ.

Our British species are

1. *C. læta* Fab. mas.—Curtis Brit. Ent. pl. 269. fem.—aurita Fab. fem.—Lat.

The females of this insect were abundant last August, entering holes in sandy places at the back of the Isle of Wight, and also at Ramsdown in Hampshire; but it is remarkable that I never saw a single male.

2. *C. quinquecincta* Fab. mas.—Panz. 63. 12.—quadricinctus Panz. 63. 15. fem.

Found in June in sandy places, also in July, I believe, by Mr. Dale on Parley Heath.

3. *C. labiata* Fab.—Panz. 63. 16.—Sturm Verz. t. 3. f. 7.

This species with its singular labrum I have taken in Norfolk.

4. *C. quadrifasciata*? Fab.—Panz. 63. 14. mas.

I took a male flying amongst heath the 30th July.

5. *C. ornata* Fab.—Panz. 63. 10. fem.

I once met with this insect either in Norfolk or Suffolk.

The plant is *Mentha rotundifolia* Smith (Round-leaved Mint).

* The dissections were made from a female, and in some of the plates the 5th and 6th joints of the maxillary Palpi are wanting, the first specimen examined having been injured.



PHILANTHUS ANDROGYNUS.

ORDER Hymenoptera. FAM. Crabronidæ Lat., Leach.

Type of the Genus, Crabro Androgynus Rossi.

PHILANTHUS Fab., Panz., Lat.—Simplephilus Jur.—Crabro Rossi.

Antennæ remote, inserted in front of the face, short, robust, velvety, attenuated towards the base, 13-jointed in the males; 12-jointed in the females; basal joint scarcely longer than the 3rd, 2nd subglobose, 3rd obconic-truncate, the remainder subquadrate, terminal joint semiovate (1).

Labrum transverse, sides somewhat reflexed, anterior margin sinuated, producing a tongue or membrane beneath, lobed in the centre, with a small tubercle surrounded with a few long hairs (2).

Mandibles large, long, bent, acute, crossing when at rest, narrowed suddenly below the middle and slightly pilose (3).

Maxillæ thick, attached by a long incurved stalk, and terminated by an oval pubescent lobe, with a smaller one below. *Palpi* short and slender 6-jointed, basal joint minute, 2nd the longest, clavate, the remainder of nearly equal length, the terminal one very slender and subfusiform (4).

Mentum long, fusiform, incurved at the base. *Lip* large, broad, cordiform, membranous and pubescent. *Palpi* shorter than the lip, composed of 4 nearly equal subclavate joints, the terminal one obovate (5).

Head very broad and orbicular. *Clypeus* quadridentate, the 2 central teeth the largest. Eyes notched on the inside. *Ocelli* 3 in triangle. Thorax oval. Abdomen ovate conic. Superior Wings with 1 marginal and 4 submarginal cells. Legs strong. *Tibiæ*, anterior with a long spine at the apex producing a dilated and membranous margin, the 4 posterior spined. *Tarsi* 5-jointed, basal joint very long, 4th the shortest, the former emarginate at the base in the anterior pair and with the 2nd, 3rd and 4th producing long lanceolate appendages on the outside. Claws simple. *Pulvilli* distinct (8, fore leg of a female from which sex all the dissections were made).

ANDROGYNUS Rossi.—pictus Panz., Fab.—apivorus Lat.—diadema Jur.

Female. Head and thorax black, shining, pubescent and thickly punctured, the face below the antennæ pale amber, and a line behind the eyes ochreous. Trophi ferruginous, the mandibles tipped with black; a transverse line on the collar, another at the base of the postscutellum, and a spot on each scapula pale yellow: the postscutellum very minutely and thickly punctured. Abdomen and legs yellow, the former with a few scattered punctures, the base black, every segment, excepting the apical one with a black band at the base forming a triangle in the centre, but very small on the penultimate joint. Coxæ and base of thighs black, tarsi slightly ochreous.

In the Author's Cabinet.

1/2 new of 1863. 3000. 18. Berlin 2 44/7

PHILANTHUS was not known to inhabit this country until last autumn, when I discovered specimens at the back of the Isle of Wight, and afterwards near Heron Court, in company with the Hon. Charles Harris, the middle and end of August. They were either resting upon the ground amongst multitudes of bees (*Andrenæ*, &c.), and of the *Cerceris* lately figured, or were flying over grassy places at the borders of a corn-field, and settling upon Hawk's-weed and other flowers.

Latreille's account of this fine insect is too interesting to be omitted. They do not, it appears, live in society, but both sexes are found upon flowers in sandy districts; the female burrows in the earth; and placing a bee there, most commonly an *Andrena*, which she has killed, deposits an egg near and closes up the hole.

The same author says, the *P. apivorus* (which is our insect) is a dangerous enemy to the hive-bee. The females dig, in light soil, on a declivity exposed to the sun, a gallery almost horizontal, and about a foot deep; she employs her mandibles and her feet to raise and remove the earth, which is collected as she proceeds with her labour. When their nest is finished they go and search the flowers to find a bee, which they kill by piercing it with their sting where the head or abdomen is united to the thorax, and afterwards carry it to the end of their burrow. As each female lays at least five or six eggs, it follows that the same number of bees are destroyed; and consequently when they abound in the neighbourhood of hives, it is probable that they do great mischief.

Melampyrum arvense (Purple Cow-wheat), the local and beautiful plant figured, I have gathered from the end of July to the beginning of September, in corn-fields at the top of the Cliff in the neighbourhood of Niton in the Isle of Wight, where it is sometimes so abundant that the bread is discoloured and rendered unwholesome by the vast quantity of the seeds which are mixed with the wheat.



Phyllocnistis citrella L.

ODYNERUS PARIETINUS.

ORDER Hymenoptera. FAM. Vespidae Lat., Leach.

Type of the Genus Vespa parietinus Linn.

ODYNERUS Lat., Leach.—Vespa Linn., Fab., Panz.

Antennæ inserted in the centre of the face, approximating, slightly geniculated, subclavate, 13-jointed in the male, the 2 last joints forming a small claw; 12-jointed in the female, 1st joint long, 2nd small, 3rd not so long as the first, the remainder short, terminal joint ovate (fig. 1, antenna of female).

Labrum dilated at the base, where it is concealed by the clypeus, narrow and elongated towards the apex which is ciliated (2).

Mandibles when at rest forming a beak, elongated, acute, slightly bent, having 5 blunt teeth on the internal margin (3).

Maxillæ corneous below the palpi, coriaceous above, membranous at the margins, terminal lobe elongated hairy, somewhat articulated near the apex, internal lobe small hairy. *Palpi* longer than the maxillæ, 6-jointed, the 2 first the most robust, the 3 first of equal length rather longer than the others, terminal joint ovate (4).

Mentum corneous, elongate, emarginate, (5 a) : *Palpi* shorter than the lip, slender, 4-jointed, 2 first long clavate, 3rd short, 4th small ovate (b) : *Lip* coriaceous, striated transversely, elongated, dilated, and bilobed at the apex, each lobe terminated by a gland (c) : *Paraglossæ* shorter than the lip, glandular at the apex (d),

Head orbicular. Clypeus convex, cordiform, emarginate at the apex.

Eyes deeply emarginate. Ocelli 3, in triangle. Thorax ovate quadrate. Scutellum rounded. Abdomen ovoid-conic, peduncle very short, basal joint somewhat contracted, bell-shaped, 2nd large.

Wings; superior folded when at rest, with 1 marginal and 3 perfect submarginal cells. Tibiæ spurred. Tarsi 5-jointed, basal joint long, 4th very short, cleft. Claws bifid. Pulvilli distinct (8, a fore leg).

Females and Neuters armed with stings. Larvæ omnivorous.

PARIETINUS Linn. Faun. Suec. p. 418, n. 1679.

Female. Black, punctured, pubescent. Antennæ, basal joint beneath yellow, the remainder orange; a spot at the base of each mandible, 2 small spots at the apex, and 2 lunular at the base of the clypeus, one between the antennæ and a very minute one behind each eye, yellow. Thorax with a bilobed yellow spot on the anterior margin, a small one beneath each wing and 2 larger upon the scutellum of the same colour. Wings slightly fuscous, stigma ferruginous. Abdomen shining, sparingly punctured, basal joint yellow at the posterior margin, leaving a triangular black space in the centre, 4 following joints with a broad yellow margin, terminal joint with a large yellow spot in the middle. Thighs yellow at the apex. Tibiæ yellow, ferruginous at the apex, anterior with a black stripe on the outside, the others on the inside, next the apex. Tarsi ferruginous, inclining to fuscous.

In the Author's and other Cabinets.

Magnum G. 911317, Savon. M. 241527, Dec. 1842 p. 32

SOME wasps, like the bees, live in society, constructing nests composed of cells, but formed of very different materials. The *Odyneri* on the contrary do not unite to form a nest to live in, whence they are called Solitary Wasps: their economy, however, is exceedingly curious, and they exhibit a degree of instinct which can scarcely be surpassed. Their eggs are deposited in cells made in old walls or sandy banks, about which the species may be found in June, as well as upon flowers.

My friend Mr. Charles Fox detected upon the top of a book, across which another was laid, some cells of a somewhat triangular form, covered externally with mud and formed of a silky substance within: he very obligingly transmitted the book to me last winter, and in the spring nearly 20 specimens of the insect figured made their appearance; they were all females, and did not vary in the least. I have no doubt of their being the *Vespa parietinus* of Linnæus's *Faun. Suec.* of which there is no figure that I am acquainted with, Panzer's *V. parietina* being the *V. muraria* Linn. It is very easily distinguished from our other species by the unclouded wings and the entire orange underside of the antennæ.

The following species are in the Author's cabinet.

- 1 *O. spinipes* L., *Panz.* 17. 18.
- 2 *pictus* Nob.
- 3 *murarius* L.—*parietina* *Panz.* 49. 24.
- 4 *Scoticus* Nob.
- 5 *Antilope* *Panz.* 53. 9.
- 6 *parietus* L., *Schæff. Icon.* 24. 3?
- 7 *similis* Nob.—*quadratus* *Don. Brit. Ins.* 14. 495. 2.
- 8 *nigricornis* Nob.
- 9 *parietinus* *Linn. Faun. Suec.* 1679.
- 10 *quadratus* *Panz.* 63. 3.
- 11 *angulatus* *Don.* 14. 495. 1. 1.
- 12 *flavipes* Nob.
- 13 6-fasciatus? *Fab.*
- 14 4-fasciatus? *Fab.*
- 15 emarginatus *Fab.*
- 16 *bidens* *Linn. S. N.* 2. 951. 16.
- 17 *connexus* Nob.

O. pictus has a very shining abdomen.

O. Scoticus has rufous tibiæ and tarsi.

O. similis may be only a variety of *O. parietus*.

O. nigricornis has the apex of the abdomen and antennæ, except at the base, black.

O. flavipes may be only the male of No. 10.

O. connexus is like No. 16, but has an entirely black thorax.

The campanulate and narrow basal joint of these 2 species approaches the form of *Eumenes*.

Borago officinalis (Common Borage) accompanies the insect.



EUMENES ATRICORNIS.

ORDER Hymenoptera. FAM. Vespadæ Lat.

Type of the Genus Eumenes atricornis Fab.

EUMENES Fab., Lat., Ill. Vespa Linn.

Antennæ inserted in the centre of the face, approximating, slightly geniculated, thickest toward their extremities, 12-jointed, the male having a thirteenth joint like a claw, equal in length to the last 3 joints. First and third joints long, second small. (f. 1. Antenna of male.)

Labrum an elongated triangle, or quadrate broadest at the base, ciliated in front. (2.)

Mandibles when at rest forming a rostrum or beak, long, narrow, having 3 clefts, which form 4 teeth on the internal edge. (3.)

Maxillæ elongated, ciliated, coriaceous towards their apex, corneous next the palpi, and at their base. *Palpi* very long, 6-jointed, first and second joints long, third shorter, 3 last small and slender. (4.)

Mentum oblong, cylindric, contracted above the insertion of the palpi. (5. a.)

Palpi long, 4-jointed, 2 first long and clavate; third, half the length of second; the fourth very small. (5. b.)

Lip coriaceous, striated transversely, elongate, dilated at the apex, bilobed, each lobe terminated by a gland (5. c.); a moveable lobe on each side shorter than the lip, dilated at the base, and terminated by a gland. (5. d.)

Clypeus convex, cordiform, bifid in front. Eyes deeply emarginate.

Ocelli 3, distinct, smooth. Thorax with a triangular piece extending from the anterior margin to the scutellum. Abdomen with the first segment contracted into an arched, elongated peduncle, equal in length to the rest of the abdomen, or with a short funnel-shaped segment, the remaining 6 joints ovate-conic. Superior wings folded when at rest, 3 submarginal cells complete. Tarsi, first joint equal in length to 3 following; fifth terminated by pulvilli and claws, with a tooth on their internal edge. (8.) Females and Neuters armed with stings. Larvæ omnivorous.

E. ATRICORNIS Fab. Syst. Piez. 289. 17.

Black, hairy, punctured, a yellow spot between the antennæ; clypeus partly or entirely yellow; anterior margin of thorax, base of the wings, posterior margin of scutellum, and a spot on each side, yellow; margin of peduncle, a large spot on each side first joint of abdomen (which is campanulate), a broad sinuated margin, and narrower margins to the 2 following joints, yellow. Legs yellow. Thighs black. Wings fuscous. Claw of antenna yellow.

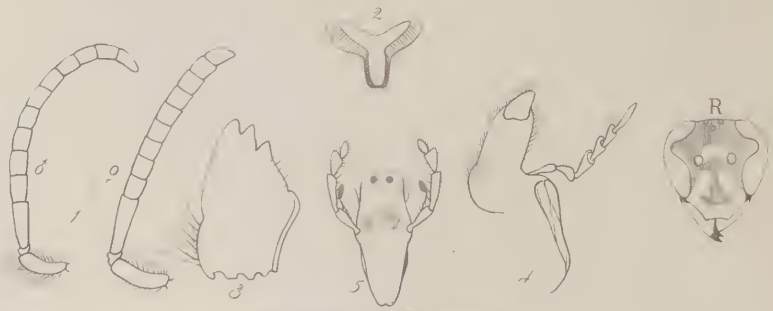
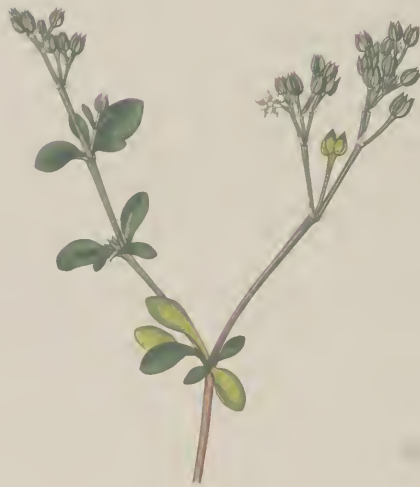
In the Cabinets of Mr. Dale and the Author.

Antennæ of female 2.900/100, 2.900/100, 2.900/100

THE genus *Eumenes* is composed of those Wasps which are solitary in their habits; not congregating and forming nests, like the common Wasps and Hornets; Fabricius in his *Systema Piezatorum* described 23 species, 3 of which are European, and Panzer has added 3 or 4 more to them; but it was not recorded as a British genus until my friend the Rev. W. Kirby (equally celebrated for his invaluable works and for his acute observations) discovered it in an entomological excursion with Mr. Dale upon Parley Heath, on the borders of Hampshire, July 3, 1821;—at the end of August 1822, I captured 2 on the same heath upon gravelly and dry banks; and earlier in the last year, I am informed by Mr. Bentley, it was found by him settling upon different species of *Ericæ* which are common in such situations.

Eumenes may probably at a future period be separated into two genera; but as I cannot detect any important differences in the Trophi after the most careful examination, I shall only propose to make 2 divisions of them: the 1st may contain the species with a long petiole to the abdomen; the 2nd (to which our Insect belongs) those with the 1st segment short and funnel-shaped, of which the parts composing the mouth agreeing with the habit of the Insects, are more robust and obtuse than in the 1st division.

The plant figured is the beautiful *Erica Tetralix* (Cross-leaved Heath).



760.

VESPA RUFA.

The Anchor-faced Wasp.

ORDER Hymenoptera.

FAM. Vespidae.

Type of the Genus, Vespa vulgaris Linn.

VESPA Linn., Fab., Curt., &c.

Antennae inserted near the middle of the face, remote, longer than the thorax in the *males*, slightly attenuated to both extremities, 13-jointed, basal joint long, hairy, curved, 2nd cup-shaped, 3rd the longest, remainder oblong, apical joint ovate-conic (1 ♂): not longer than the thorax in the female and neuter, 12-jointed, basal and 3rd joints longer, the remainder more quadrate than in the male, apical joint short and conical (1 ♀). *Labrum* semiovalate, with a rigid, linear, ciliated, projecting process in front (2).

Mandibles truncated obliquely, denticulated, having 3 teeth (3). *Maxilla* terminating in a long hairy process, with a smaller subovate trigonate lobe at the apex. *Palpi* moderate, slender, slightly pubescent and 6-jointed, basal joint slender, clavate, 2nd a little stouter, 3rd the largest, longer, obconic, truncated obliquely, 4th and 5th the same shape but smaller, 6th the longest and slenderest, subfusiform (4).

Mentum oblong, narrowed towards the base. *Palpi* attached to the anterior angles, tolerably long, pubescent and 4-jointed, elongate-pyriform, 2nd the longest subclavate, 3rd the stoutest, short, obtusate, 4th small ovate. *Lip* large, 4-lobed, the centre a little narrowed and cleft at the apex, with a spreading rounded lobe on each side, with a callous or glandular patch at the apex of each (5).

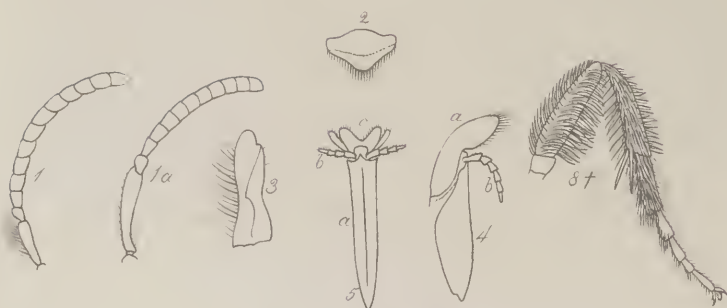
Head transverse, face ovate (R): eyes long, notched internally: ocelli 3 in triangle on the crown. Thorax broader than the head, oval, collar bilobed; scutellum large, transverse and semiovalate. Abdomen with a short petiole attached to the inferior surface of the base which is truncated abruptly, long ovate and 7-jointed in the male, the apex conical; shorter, broader, and 6-jointed in the female; an acute sting in the female and neuter. Wings folding longitudinally; superior with 1 marginal and 4 submarginal cells. Legs stoutest in the female; thighs tapering at the apex: tibiae short, hinder the longest, all spurred, anterior with only one spine: tarsi longish, especially the hinder, 4 anterior a little dilated in the female, 5-jointed, basal joint the longest, 2nd and 3rd obtusate or crescent-shaped, 4th bifid, 5th clavate: claws and pulvilli moderate.

RUFa Linn.—Curt. Guide, Gen. 697. 3.

WASPS, like the hive-bee and ants, live in societies, which consist of three different kinds of individuals, males, females, and neuters or workers. The male wasp has no sting, is as long as the female, but much more slender and elegant in form, and more handsomely marked with black; the female is the largest sex and armed with a sting, as is also the neuter, which is a miniature likeness of her.

cf. de Saule 6-905 35. Göttingen 1895.





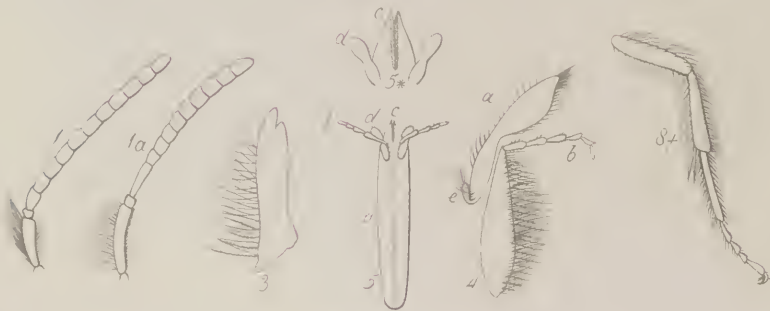
Chrysomelidae, Anthrenus



Painted by Charles May 1 1854



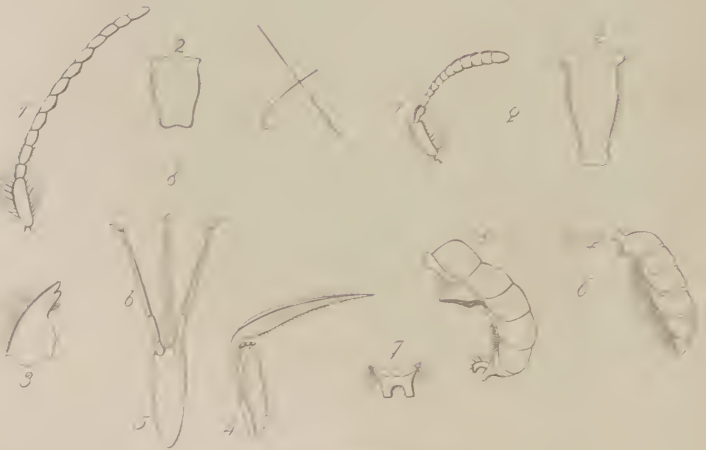
(*Mesopitula catenata* M.)
(*Coloneaster vulgaris*) (Colomites)



(*Mesopitula catenata* M.)







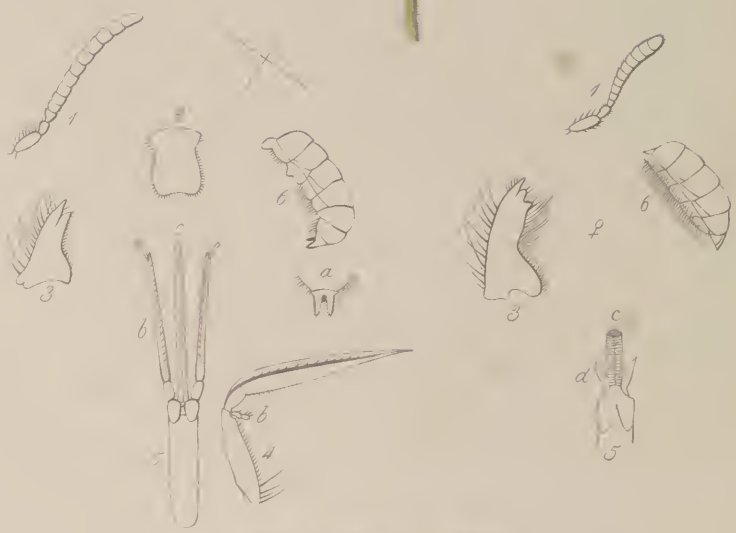
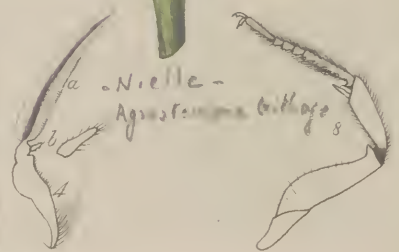


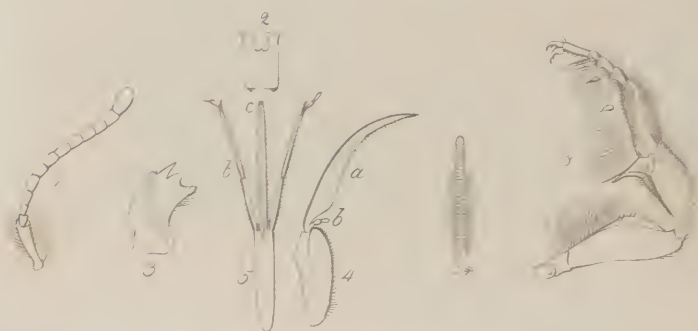
Illustration of the head and mouthparts of a fly.



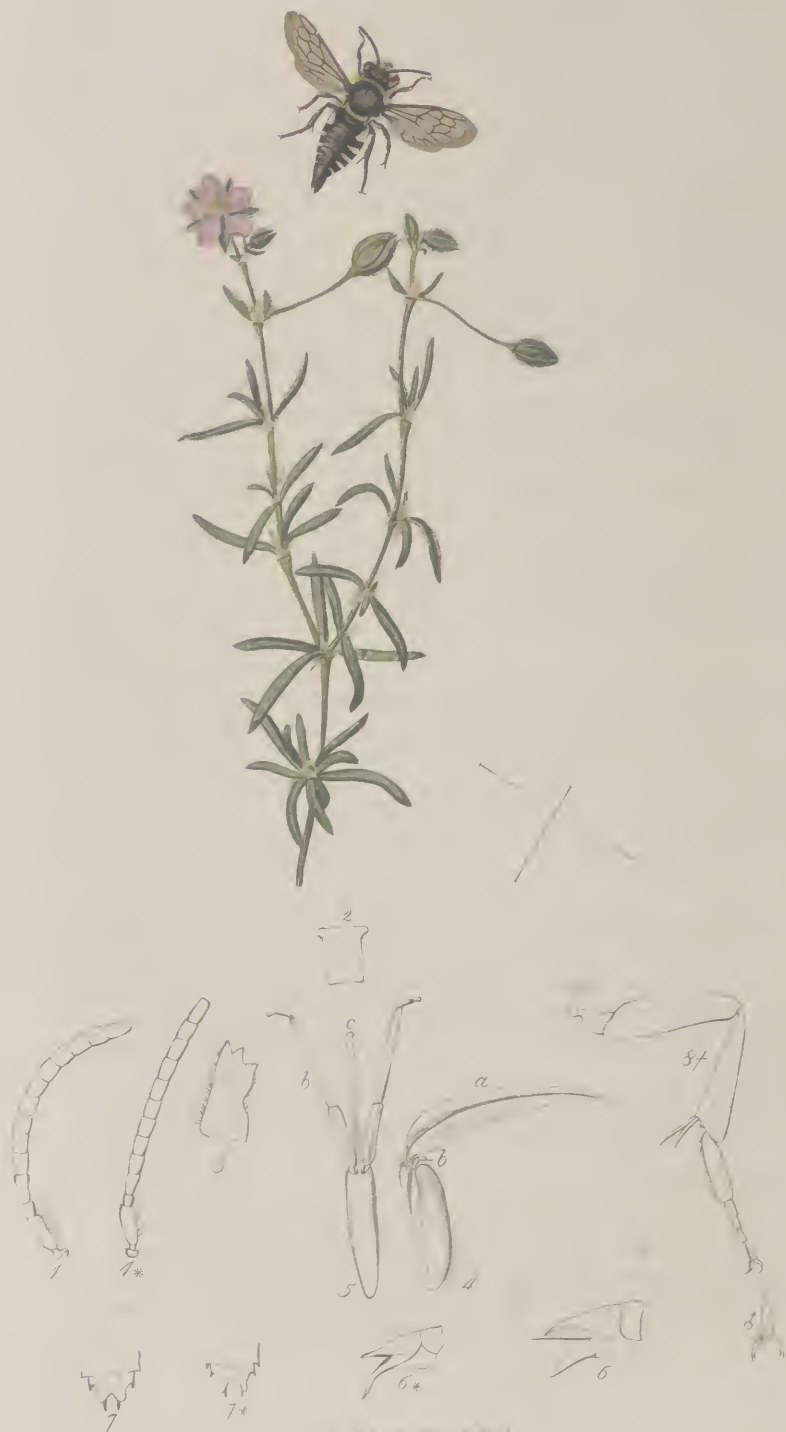
of flowers / M. ng

Niella -
Agrostemma orthogon





Salvia officinalis L.









Enallagma cyathigerum Linn. *Fig. 1. 1824*



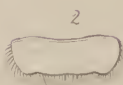




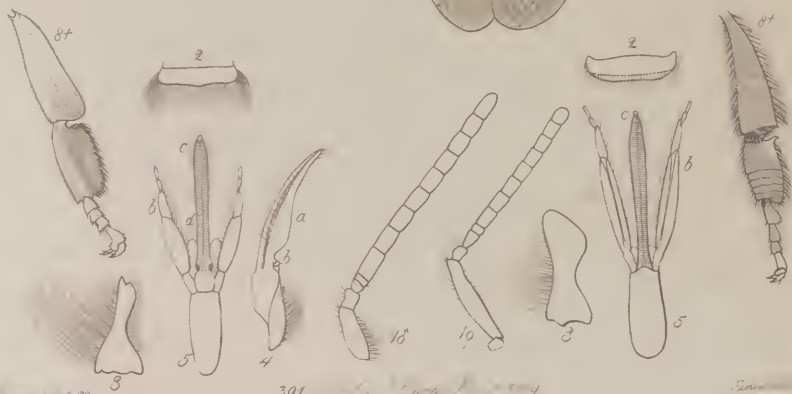
Digitalis purpurea



Phacelia *Phacelia*



Phacelia *Phacelia*







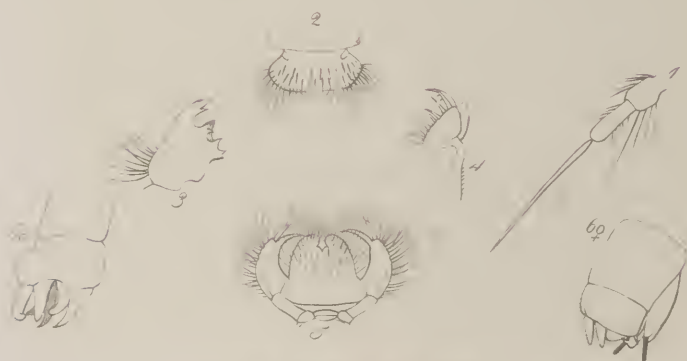
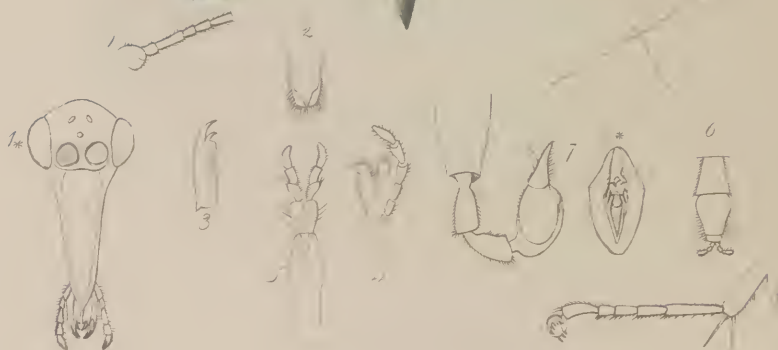


Fig. 1. 2. 3. 4. 5. 6. 60.





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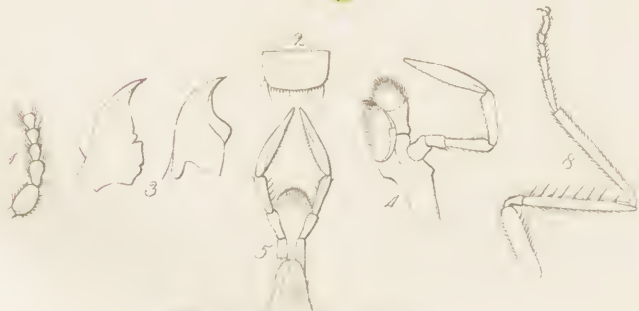


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Funaria hygrometrica Linn. (Moss)



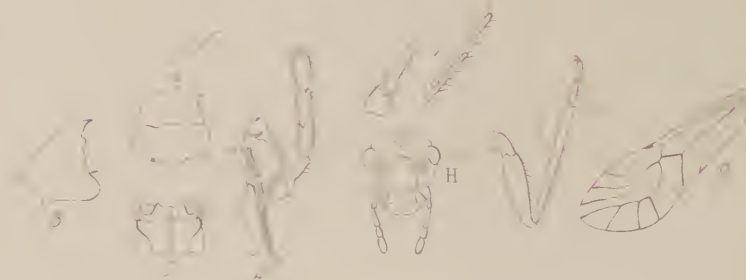


Wm. J. G. Smith Del. 1880



Trifolium glomeratum

Trifolium glomeratum



Sedna flavipes



Drawn by F. Curtes London Sept 7 1824

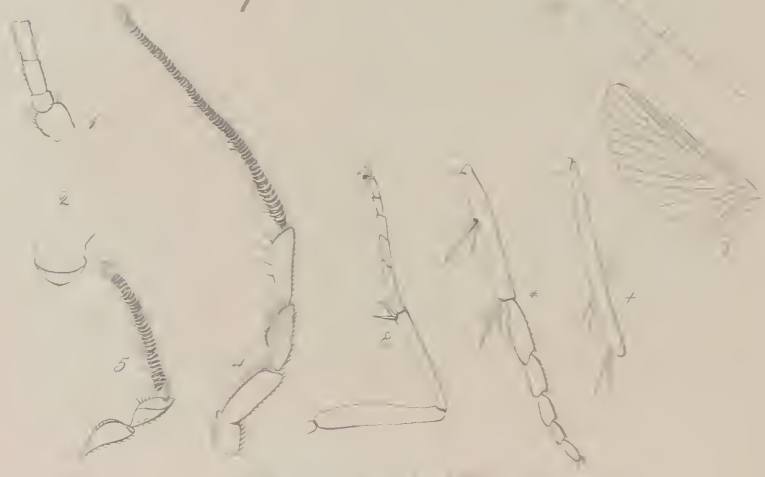








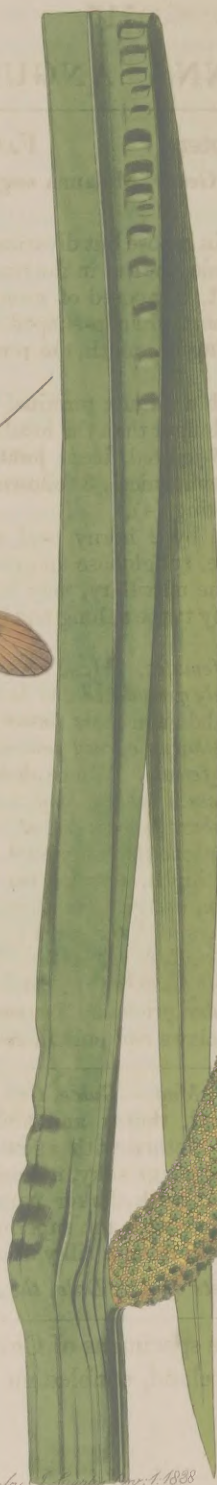
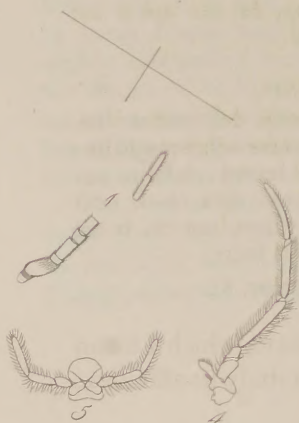




Phaenocarpa n. sp.

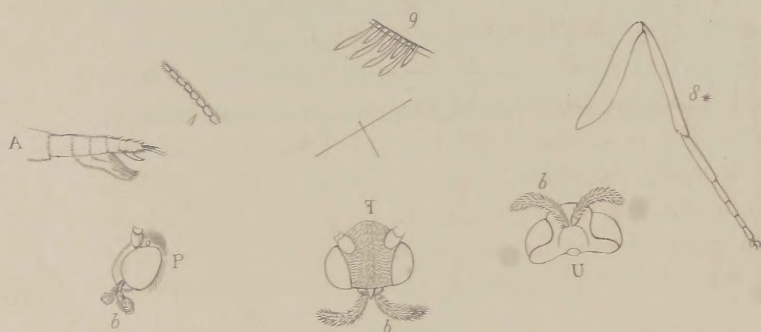


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